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ADVANCES IN THE TREATMENT OF PELVIC INFLAMMATION.*

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Pelvic inflammatory disease in the female occupies a very prominent position in gynecology, not only on account of the frequency of its occurrence, but also on account of the permanent damage to the pelvic contents which necessarily supervenes in a high percentage of cases.

It is estimated that about 75 per cent of such cases are due to gonorrhea, the remainder being principally due to infections following abortion and labor at term.

There is usually a very marked difference in symptomatology and nature of these two infections. Gonorrhea extends by the route of the mucous membranes. It rarely causes high temperature or pulse rate or marked leucocytosis and may in a sense be regarded as a local inflammation. Where the inflammation is due to puerperal infections, however, the extension is principally by the lymph channels and produces a cellulitis and extension into the pelvic cavity by that route. It is attended, as a rule, by high fever and pulse rate and by a marked leucocytosis and, on account of its absorption, should be classed as a septicemia.

Not all the cases of pelvic inflammation following abortion or labor at term are, however, due to septic infection. This is a very favorable time for a gonorrheal infection in the lower genital tract, particularly when the infection involves the cervix, to ascend, due to the open condition of the uterus. However, the symptoms usually indicate the difference in the type of infection.

One of the most interesting developments in the study of gonorrheal infections is the question of chronicity, and the location of the infecting focus. It was for a long time the opinion of gynecologists that the focus of infection remained in the tube that has been once infected and that the recurring attacks were due to a lighting up of this latent infection. The studies of A. H. Curtis,[1] carried out over a period of years, changed this conception. Tubes that were removed were ground up and subjected to a thorough laboratory examination. Based on the result of these investigations, he makes the unqualified statement that in all of his experience he has never isolated the gonococcus from the secretions of patients who either failed to reveal gross evidence of active inflammation or who had been free from fever for a minimum of ten days. In his opinion, which has been generally accepted, the recrudescence was due to reinfection, either from intercourse or from ascent from foci of infection in the lower genital tract. There are here three points which are commonly infected and in which the infection may remain indefinitely until eradicated—Skenes glands, the cervical glands, and Bartholins glands. The acceptance of this fact has a marked bearing on the treatment of this disease.

On the other hand, puerperal infections are of a septic nature and the infection may persist for a long period of time in the pelvic tissues. Operation during the acute stage, except for the drainage of abscesses, is attended by such a high mortality as to be prohibitive, and this danger often persists for many months, sometimes for years.

Based on these observations, the treatment of pelvic inflammation, both of the acute and chronic forms, has undergone a marked change. In my earliest experiences in gynecology the inflamed pelvis, both acute and chronic, was operated when diagnosed. The conception was expressed by Dr. Joseph Price as a "puddle of pus", and in order to save the patient from dire consequences immediate operation was undertaken. No attempt was made to differentiate the type of infection. It is needless

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to say that the operations were radical, frequently involving the removal of all of the pelvic organs and were complicated by free drainage of various sorts. It is also needless to say that the mortality was high some of the hospitals reporting a mortality of 25 per cent. However, those that got well were regarded as saved. Following in the wake of this operative onslaught a disconcerting fact was observed in that hard-headed women who refused operation got well also.

In a paper written by me[3] in 1907, based on a growing experience, I made the following points:

"The rules that apply to acute appendicitis and other abdominal conditions do not apply to pelvic inflammation.

"A sharp distinction should be made between acute and chronic cases. The only operation indicated in acute cases is the evacuation of abscesses.

"An operation performed in the acute stage must be radical, so that even in those cases which recover, the patient still has to suffer from the effects of an artificial menopause.

"In a large number of cases, complete resolution will take place under proper treatment, even though there may be a very marked inflammatory mass in the pelvis. As recovery is often complete and permanent without operation, in these cases an operation would have been unnecessary. It is not easy to determine when this satisfactory termination will take place, but it is certainly advisable to give all cases a chance. The question of operation can be determined later.

"Under proper treatment a fatal termination in an unoperated pelvic inflammation is of very infrequent occurrence.

"The treatment advocated was: Absolute rest in bed in the Fowler position, food restricted to the lightest and most easily digested diet, withdrawal of all food where there is peritoneal involvement but the ingestion of large quantities of hot water, proctoclysis by the Murphy drip, copious hot vaginal douches.

"As a rule, we find that the fever rapidly subsides and the inflamed tissues begin to undergo resolution.

"Where symptoms persist after the acute stage has passed and the patient has attained all the improvement she is likely to receive, operation is advised. This consists principally of separation of adhesions, removal of the tubes and suspension of the uterus with catgut. This last is done to prevent the uterus dropping back in the inflamed area behind the uterus. After the catgut is absorbed the uterus regains its mobility."

The tubes were removed because they were considered the focus of infection and the potential cause of subsequent attacks of inflammation. It was believed that after the pathological tubes were removed that the other evidences of inflammation would undergo resolution. This seemed to be the case and such patients made a good symptomatic recovery in a very satisfactory percentage of cases and remained well, although they were sterile. This was considered an advantage over more radical operations because the patient retained the organs essential to menstruation and the endocrine balance, although they were sterile.

These views expressed at that time evidently accorded with the views of other gynecologists of experience. C. Jeff Miller,[2] in a recent textbook, writes: "The treatment of tubal disease was formerly strictly surgical; operation was done routinely as soon as the diagnosis was made, and ablation of the entire genital tract was usually the procedure employed. The result was not only a group of thoroughly unsexed women, at least in the anatomic and physiological sense, but also a death rate of approximately 20 per cent."

In 1909 (two years after my paper), F. F. Simpson[4] read before the American Gynecological Society a paper which revolutionized the treatment of pelvic inflammation. In it he set forth a mode of therapy hitherto unheard of. Instead of the old plan of immediate surgery he advocated a new plan of expectant treatment, and he proposed that surgery be postponed until the temperature had been consistently normal for at least three weeks, even after repeated bimanual examination and until there had been a complete absorption of the inflammatory exudate surrounding the primary focus of infection. He reported a series of 456 cases with a mortality of 1 per cent, in contrast to the 20 per cent, which was the average death rate for the older method of immediate operation. This added what was called the cooling process, which was more or less generally adopted. In our operative Clinic at the Medical College of Virginia deaths were so infrequent that several years would go by without one.

In 1921, A. H. Curtis[1] published his researches in reference to the viability of the gonococcus, already

referred to, which established the fact the gonococcus continues only a short while as an infecting organism in the tube and that it was no longer thought to be necessary to remove the tubes because of their being a focus for re-infection.

The expectant treatment in acute cases consisted of complete rest in bed, applications to the lower abdomen of either heat or cold, and the application of heat to the pelvic organs by copious hot douches. In addition various other treatments were advocated and used, particularly foreign proteins and vaccines. Abscesses, when they occurred, were drained.

It is interesting to note that heat has always been regarded as a valuable means of combating inflammation. In 1879, T. A. Emmet advocated the hot douche and gave specific directions as to its use. Unfortunately these directions have not been followed always, and the douche has fallen to some extent in disrepute. Where properly administered it is still a valuable treatment for pelvic inflammation. It is not the douche powder but the heat that accomplishes the result.

With the advent of diathermy a more direct method of applying heat to the pelvis has been found. Still more recently the Elliott treatment was introduced. This latter consists of introducing a properly fitting rubber bag in the vagina through which hot water with a controllable temperature is driven by a pump. The bag becomes distended by the water, distends the vagina and comes into close approximation to the pelvic organs. By this means the temperature in the pelvis can be raised to a point that is lethal to the gonococci.

We have found at Stuart Circle Hospital, where these treatments have been in use for some years, that the benefits of these treatments have been striking. Ordinarily for acute cases, especially of gonorrhea, the best results are secured by the Elliott treatment. In chronic cases two forms of diathermy are used, the old form where one electrode is introduced through the vagina and the circuit completed by a pad on the back or abdomen, and the short wave where the heat is generated in the tissues by placing one pad on the lower abdomen and one on the back. The results have been so excellent that operations for pelvic inflammatory conditions have been largely superseded. During the year 1936 approximately 967 treatments were given for pelvic inflammation to approximately ninety-five patients. Of these, 567 Elliott treatments were given for acute pelvic inflammation to fifty-five patients. The other 400 treatments were given for chronic inflammation, about evenly divided between the two diathermy methods. These last figures are approximate because of the fact that this treatment was given for other conditions also and no exact account was kept of which diagnoses were covered.

It must not be understood that no operations are done for cases of pelvic inflammation, but such operations are for the permanent results of the inflammation and for other complicating conditions after the inflammation has been cured.

Operation will doubtless be indicated in many of the cases occurring in irresponsible and uncontrollable patients where cooperation cannot be secured. In the higher types, however, where cooperation is given, the results in acute cases with the Elliott treatment are most satisfactory and in many cases brilliant.

As a type of what can be done I will report only one case, because a subsequent appendicitis afforded the opportunity for a visual inspection.

The patient was a young girl who unfortunately contracted gonorrhea.. When she was presented for treatment the pelvic examination revealed a fixed uterus and large adherent tubal masses. She had a temperature averaging around 101°F. She was kept quietly in bed and given Elliott treatments. She rapidly improved and before she left the hospital her uterus had become freely movable and the masses had disappeared. She reported at intervals and it was found that there was an erosion and a persistent but scanty purulent discharge from the cervix. This was cured by an electrical cauterization. Subsequently her tubes were tested by the Rubin test and found to be patulous. A year following her original admittance she was operated on at Stuart Circle Hospital for appendicitis. This afforded an opportunity for inspection of the pelvis which showed that the only evidence of the pelvic inflammation was one adhesion between the right tube and the appendix. This was divided. The patient was perfectly cured from a condition that a few years back would have resulted at least in the loss of the tubes with a consequent sterility.

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DISCUSSION

DR. C. J. ANDREWS, Norfolk: Dr. Robins has presented a very valuable story of the treatment of pelvic inflammation. His reference to the history of the condition is most interesting. The conservative methods are now generally agreed upon in principle but cannot be overemphasized and no doubt need re-stating from time to time.

Pelvic inflammation is still a dangerous and disabling disease. Operation in the acute stage may be highly disastrous, and particularly is this true if the inflammation follows criminal abortion or attempted abortion.

The Elliot treatment is a product of recent years. My own experience with it has extended over about three years and has been limited largely to private patients. The results have been most spectacular in the treatment of acute gonorrhea. Since sulfanilamide has become popular I have used this in conjunction with it with gratifying results in a few cases.

Many of the acute pelvic conditions are so completely relieved that no operative procedure is ever needed, but in some a chronic condition will ensue with minor recurrences which eventually require operative measures, but even in these the operation will be less extensive and the result more satisfactory.

Unfortunately, it is still necessary to make a diagnosis in these conditions. The Elliot treatment will not be helpful in ectopic pregnancy, acute appendicitis, endometriosis and various other pelvic conditions. There is, however, a class which may be grouped under pelvic pain due to chronic inflammation which are often very satisfactorily relieved by the use of this method.

DR. RANDOLPH H. HOGE, Richmond: I just want to say that the experience on the wards of the Medical College of Virginia has been in accordance with what Drs. Robins and Andrews have said. We have had a large number of cases of pelvic infection. In recent years there has been a considerable decrease in the number of cases operated upon, this decrease being due to conservative therapy. We have been using the Elliott treatment for the past two years, and believe that this has contributed to the decrease in the number of operations.

DR. S. B. MOORE, Alexandria: I enjoyed Dr. Robins paper on pelvic inflammation. I think that is a subject that should be studied deeply.

The mortality rate can be greatly reduced by watchful waiting and more conservative treatment. Never operate until the temperature returns to normal.

Diathermy has been a great aid in my hands, and many cases where the involvement is not too great operation will not be necessary.

A few years back, we removed tubes in all of our cases, whereas today we are more conservative, with the aid of diathermy or other method of heat treatment. Today we cool down a severe pelvic inflammation, and make the patient fairly comfortable. However, I admit many cases do better by removal of the tubes, but not the ovaries.

Some men today are going through the culdesac, splitting the tubes and letting them drain; in a year or two they are practically normal, and some of them function normally.

In closing, I wish to state that diathermy and conservative methods have opened up a new field to make unfortunate females more comfortable.

DR. ROBINS, closing the discussion: I appreciate very much the discussion of my paper. I was prompted to write it because I had personally had experience with the various methods of treatment referred to and I could therefore appreciate the tremendous improvement that has been made in the treatment of pelvic inflammation. I thank Dr. Andrews, Dr. Hoge and Dr. Moore for their thorough discussion and am glad that their experiences coincide with mine.

EARLY RECOGNITION AND MANAGEMENT OF NEUROSYPHILIS.*

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The diagnosis of late neurosyphilis is a relatively easy task. The detection of an early invasion of the nervous system by the spirochaeta pallidum often taxes one's diagnostic acumen.

As our work deals primarily with mental patients, we are constantly on the alert for neurosyphilis. Even so, at times we find ourselves in the midst of a laboratory diagnosis. The protean character of the disease here, as elsewhere, often prohibits a definite conclusion from the symptoms and signs

*Read before the Southwestern Virginia Medical Society, at Mountain Lake, Va., September 3, 1937, as part of a Symposium on Syphilis.

alone. In such cases physical, neurological and mental findings will not justify a diagnosis of neurosyphilis and the laboratory must be relied upon. However, there are certain key symptoms and signs which lead to further investigation and the proper conclusion. This general symptomatology is reviewed with no suggestion of originality on the part of the writer.

TABLE 1.

THE IMPORTANT SYMPTOMS OF NEUROSYPHILIS
(after Stokes)

Headache	Pupillary signs
Lightning pains	Seizures or convulsions
Paresthesias	Speech disorders
Disturbance of bladder control	Cerebral neurasthenia
Ocular symptoms	Delusions
	Character change
	"conduct slump"

Headache.—This may vary from a diffuse, moderate and persistent pain to the severe boring and blinding pain of brain tumor, with projectile vomiting.

Lightning Pains and paresthesias are extremely early symptoms. The typical lightning pain is sharp, stabbing, spot-like and may recur again and again in the same place. It often singles out a spot such as the heel or the instep for repeated shocks.

Paresthesias.—These may consist of fleeting attacks of numbness, tingling, prickling, constriction, sensations of cold or heat; shifting from point to point or involving an entire limb or side of the body.

Disturbances of Bladder Control and of Sexual Reflexes are coming into recognition as important early signs of lower cord changes and as among the first warnings of tabetic neurosyphilis in particular. The onset may be entirely insidious and the patient may be unaware of the gradually developing atony of the bladder musculature from paralysis due to impairment of its innervation. Cystoscopic examination is a valuable aid in the diagnosis.

Ocular Symptoms and Signs are dependent in the early years on meningeal lesions. The ptosis, diplopia and strabismus are parts of the general group of cranial nerve syndromes. The Argyll-Robertson pupil is practically pathognomonic of neurosyphilis. Even before the loss of the direct light reflex, as Sadler points out, the consensual light reflex may disappear. This consists in the dilatation or contraction of the pupil of one eye when the other eye is shaded or exposed to direct light.

The Seizure or Convulsive Attack is one of the common symptoms of paretic neurosyphilis. Any paralytic stroke occurring in a patient under forty years of age should be regarded as highly suspicious of a luetic infection (J. C. K.). In one such case which we recently saw, the blood Wassermann was consistently negative while the spinal fluid showed a strongly positive reaction.

Speech Disorders are most commonly seen in the paretic. The dysarthria is accentuated by test phrases, such as "Methodist Episcopal"; "Truly Rural". One may also encounter aphasia in neurosyphilis.

Cerebral Neurasthenia.—Nonne states that a "neuasthenic with syphilis in his history suggests a paretic". Since the symptoms of neurasthenia so closely resemble, in many cases, the early signs of paresis it is obvious that blood and spinal fluid Wassermann should be done on all such nervous cases with a luetic history.

Delusions, Character Change and the term "conduct slump" may precede by months and even years the appearance of gross symptoms of cerebral or paretic neurosyphilis. In 50 per cent of the cases in our series, a change in personality was the outstanding feature. Delusions of grandiose content are, of course, easily detected as a part of paresis. Delusions of a depressed nature do not always arouse the suspicion of the examiner, since they occur so frequently in other psychoses. Delusions of one form or another were outstanding in five of the thirteen cases here presented. In only two of the cases were there lacking mental changes. Since these patients were all referred, however, the incidence of mental signs is unusually high.

TABLE 2.

EARLY SIGNS OF NEUROSYPHILIS

1. Fixed or relapsing positive blood Wassermann.
2. Spinal fluid findings: cell count, Wassermann positive.
3. Pupillary changes: irregularity, slow to light.
4. Disturbed reflexes.
5. Cranial nerve lesions: ocular and facial palsies.
6. Early sensory changes: decrease in pain, loss of bone and muscle-joint sense.
7. Personality change.

Fixed or Relapsing Positive Blood Wasserman:

Stokes states that 30 per cent of these cases have or develop neurosyphilis. Therefore, a careful search for neurological changes and spinal fluid examination is evident.

Spinal Fluid Findings: The Wassermann reaction is positive in practically 100 per cent of paretics. But in tabes we find only 70 per cent with positive blood and spinal fluid. Most of the cases of tabes, however, have a positive reaction with 1 cc. of fluid. Cell increase in the spinal fluid is a very early objective finding, since it depends on meningeal reaction which is one of the earliest forms of pathological change in the neurosyphilitic process. It warns of trouble, actual or pending.

Pupillary Change: A typical Argyll-Robertson pupil is an end-result. One should test the pupils for a relative poverty to light response, which, with a good reaction to accommodation, indicates pupillary changes very significant to this condition.

Disturbed Reflexes: Some inequality; accentuation or decrease in the deep reflexes is a very common finding of neurosyphilis.

Cranial Nerve Lesions most frequently produce changes in the eighth nerve with nystagmus or deafness; in the seventh nerve with facial palsy; in the second, or optic nerve, with disturbance in vision, and in the fifth with sensory changes over the face or cornea. If the syphilis strikes the third, fourth or sixth nerves, diplopia or some other form of oculomotor aberration results.

Early Sensory Changes: The patient should be carefully tested for "islands" of analgesia which may not be larger than a palm's breadth. Changes in vibratory sense, loss of sense of motion or position are very early objective signs.

Personality Change occurs in paresis and is here very important. As the term indicates, the person changes in his behavior or conduct to a marked degree. He becomes careless about his dress, neglects his business or makes faulty financial ventures. He may plunge heavily in a business enterprise, or the change may occur along moral lines with various sexual episodes. The memory, particularly for recent events, becomes faulty, the intelligence is lowered and the judgment becomes defective. These changes usually occur before his friends and family realize the situation and depletion of the exchequer is a very common "objective finding".

TREATMENT OF NEUROSYPHILIS

Since there are some fifteen clinical varieties of neurosyphilis, it is obvious that no fixed scheme of treatment is possible. Individualization of the therapy is necessary. The physician will employ neo-arsphenamine, bismuth, mercury and the iodides to good advantage in all cases, both as a preparatory and after-treatment to fever therapy.

Of the arsenicals having specific penetration for the central nervous system, tryparsamide is the only drug at present known that will pass the choroid plexus. It is a slow acting drug, requiring treatment for a period of one or two years. But it permits ambulatory treatment. Tryparsamide produces severe damage to the optic nerve in 9.2 per cent of the cases and for this reason the visual fields must be checked every week for the first six doses. Recently, we have used this arsenical in conjunction with fever therapy, giving the injection at the height of the fever curve. Since the vascular system is widened during this period, added penetration should be possible. No conclusions have been made thus far.

Our results with artificial fever in neurosyphilis, particularly in paresis, have been so encouraging that this method is preferred, wherever the patient's condition warrants the therapy.

TABLE 3.

CLINICAL RESUMÉ—CASE MRS. F. W.

Age: fifty. Occupation: Housewife. Infected: five years.

Signs.—Severe agitated mental depression.

Diagnosis.—Paresis, depressed type.

Treatment.—Seven fever sessions.

Results.—Recovered.

SEROLOGY

	Before Fever	After Fever
Blood Wassermann	4 plus	4 plus
Spinal Wassermann	4 plus	Negative
Cells	20	6
Colloidal gold	5555555322	5554421000
Globulin	3 plus	1 plus

Comment.—This patient suffered a severe mental breakdown. Ideas of self-accusation, loss of insight and judgment, insomnia, "nervousness" and indigestion. Physical negative. Neurological: Argyll-Robertson pupils. A very stormy course for several weeks, with deepening depression and finally into a "vegetative existence". During fever sessions patient returned to her normal mental state but relapsed after

fever subsided. At end of seventh fever was able to go home. Should have received additional fever but has been carefully watched for thirteen months. Patient is completely well except for persistent positive blood Wassermann. After-treatment: Marpharsan (Tryparsamide produced disturbance in vision).

TABLE 4.

CLINICAL RESUMÉ—MR. J. R. T.

Age: fifty-seven. Occupation: Farmer. Infected: ?.

Signs.—Depression, loss of weight, insomnia, change in personality, loss bladder control . . . . absent knee jerks, involuntary urination.

Diagnosis.—Tabo-paresis, cord bladder.

Treatment.—Ten fever sessions.

Results.—No improvement; patient died two months later.

SEROLOGY

	Before Fever	After Fever
Blood Wassermann	4 plus	4 plus
Spinal Wassermann	4 plus	4 plus
Cells	46	24
Colloidal gold	5554332110	?
Globulin	1 plus	1 plus

Comment.—This case represents a severe case of neurosyphilis. First showed increased psychomotor activity which was followed by marked depression. Rich delusional content of a fearful nature. Family noted a marked change in personality several months prior to admission. Suffered lightning pains in lower legs and gradually lost bladder control. Patient was unconscious of constant dribbling. Physical: negative. Neurological: decreased hearing bilateral pallor of optic nerve and facial asymetry, absent knee jerks. No ataxia. Mentally, markedly deteriorated. Received three fever sessions elsewhere. Temperature maintained above 103.5 degrees for seventy-seven hours and above 105.8 for forty-five hours during ten fever sessions. Patient received added benefit of chemotherapy but signs progressed with marked rapidity and he died at home two months later.

TABLE 5.

CLINICAL RESUMÉ—MR. H. Z. S.

Age: twenty-seven. Occupation: Meat-cutter. Infected: 1928.

Signs.—Disease began May, 1935. Seclusive, mute, disoriented, depressed, suicidal, violent, loss of thirty-five pounds in weight.

Diagnosis.—Paresis, mixed type.

Treatment.—Ten fever sessions.

Results.—Remission. Patient at work on full-time basis.

SEROLOGY

	Before Fever	After Fever
Blood Wassermann	4 plus	4 plus
Spinal Wassermann	4 plus	Negative
Cell count	49	6
Colloidal gold	5555442000	0000000000
Globulin	3 plus	Normal

Comment.—This patient was seen by us first in June, 1935. Mental condition consisted of above signs, which were marked in character. Patient very violent at times. With first fever session, psychosis showed marked change to elated state. With each fever session, condition improved. In two weeks patient allowed out of door privileges. Received eighty hours above 103.5 and fifty hours above 105.8. Patient has been at work steadily since November, 1935. Case has been followed closely since that time and is in full remission after two years.

TABLE 6.

CLINICAL RESUMÉ—MRS. E. P.

Age: forty-four. Occupation: Housewife. Infected: 1927.

Signs.—"Nervousness"; loss of interest in home; markedly depressed; lack of insight; loss of judgment; loss body weight.

Diagnosis.—Paresis, depressed type.

Treatment.—Eight fever sessions.

Results.—Remission. Patient at home working. Gained thirty-five pounds.

SEROLOGY

	Before Fever	After Fever
Blood Wassermann	4 plus	Negative
Spinal Wassermann	4 plus	Negative
Cell count	60	4
Colloidal gold	5555555210	55555553100
Globulin	3 plus	1 plus

Comment.—This patient was markedly depressed and disorganized. Case treated February, 1935. Physical: mal-nutrition. Neurological: contracted fields of vision. Patient showed excitement when fever produced. Received fifty-five hours above 103.5 and twenty-five hours above 105.8. Improved with each session and was discharged July, 1935. Has been closely followed for past two years and continues in remission. Husband had paresis also and was treated by us but did not pass into remission.

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TABLE 7.

CLINICAL RESUMÉ—MR. R. W. M.

Age: thirty-two. Occupation: Salesman. Infected: 1922.

Signs.—Depression; introspection; paresthesias, "nervousness".

Diagnosis.—Paresis, depressed type.

Treatment.—Ten fever sessions.

Results.—Remission; patient at home; now asymptomatic.

SEROLOGY

	Before Fever	After Fever
Blood Wassermann	4 plus	Negative
Spinal Wassermann	4 plus	Negative
Cell count	23	6
Colloidal gold	4433332110	1111110000
Globulin	Negative	Negative

Comment.—This patient treated latter part 1934. Signs were not striking at time but worried constantly over his condition. Received Swift-Ellis treatment prior to admission. Physical: negative. Neurological: negative. Received ten fever sessions with seventy-five hours above 103.5 and twenty-four hours above 105.8. Was discharged in April, 1935, and has been recently checked. Continues in clinical and laboratory remission after three years.

TABLE 8.

RESULTS OF CASES TREATED WITH ARTIFICIAL FEVER

Case	Diagnosis	Remission	Improved	Unimproved	Died
H.Z.L.:	Paresis (dementing)		x		
W.L.J.:	Paresis (dementing)		x		
C.E.S.:	Tabes		x		
R.K.P.:	Paresis (dementing)		x		
S.D.H.:	Paresis (dementing)			x	
R.P.:	Paresis (dementing)			x	
F.P.:	Asymptomatic Neurosyphilis		x		
R.H.L.:	Tabo-paresis		x		
E.P.:	Paresis (depressed)	x			
J.R.T.:	Paresis (dementing)			x	
H.Z.S.:	Paresis (mixed)	x			
F.W.:	Paresis (depressed)	x			
R.W.M.:	Paresis (depressed)	x			
Percentages		35%	43%	21%	0

H. Z. L.—Treatment was begun on this case in January of 1932. He was a dementing form of paresis and received thirty fever sessions which evidently arrested the disease. However, there had occurred sufficient parenchymatous destruction to prevent a full recovery. The patient has been at home during the past four and one-half years and has done a little work. It is interesting to know that his serolgy, both blood and spinal fluid, remained consistently positive until recent tests produced negative results with a change in the colloidal gold curve from a paretic type to zero.

W. L. J.—This patient was seen by us in June, 1935. His illness began with an hemiplegia during the night a few days prior to admission. The paralysis partly subsided, later, almost entirely. The blood Wassermann was negative, the spinal fluid strongly positive. He received six sessions of fever. We have been unsuccessful in getting him in for a check-up but in a recent interview on the street, he reported good health and has suffered no further progression of his disease. Classed as improved.

C. E. S.—Was treated in September, 1936. The diagnosis was moderately advanced tabes with lightning pains and ataxia as outstanding symptoms. He received ten fever sessions, with a marked improvement in general health and relief from pain. The patient's temperature was accidently carried to 108.5 without untoward effects. Classed as improved.

R. K. P.—This patient is still under treatment. His condition has shown marked improvement after eleven fever sessions.

S. D. H.—This man, a dementing paretic, is still under treatment. He represents a moderately advanced case with some disturbance in gait. He is reported as unimproved at this time.

R. P.—Was treated by us in February of 1935. He showed marked mental dalapidation. Fever was inadequate because of unfavorable reactions but the patient has been at home and at work at a lower position for the past two years. He is classed as unimproved.

F. P.—This man had a history of lues contracted five years before we saw him in November, 1936. He had a positive spinal fluid with paresthesias over the lower legs. Ten fever sessions were given and the Wassermann was reversed and the paresthesias alleviated. He is classed as improved.

R. H. L.—Was treated by us in July, 1933. He showed marked mental defects accompanying a well-

advanced expansive paresis. The lower deep reflexes were absent and there was marked disturbance to the gait. He was given six fever episodes, declining further treatment. He returned to his home and resumed work at his trade in a few months. We have been unable to get him in for a check-up, but there has been no relapse of symptoms. He is classed as improved. The remaining cases shown on Table eight have been reviewed in Tables three through seven. The results in the thirteen cases here presented are as follows:

Remissions	35%
Improved	43%
Unimproved	21%

These estimations have been arrived at from a very critical standpoint. One of the cases is at home and at work is classified as unimproved since there was not a great change made in his psychosis. Five are given the improved status, although they have been relieved of their out-standing symptoms. All are at home and some of them at work. Further time will be required to properly evaluate the end-results.

The four cases in remission have been well for an average period of two years. They have been closely followed and none show evidence of clinical relapse.

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Theory and Practice of Psychiatry—Sadler.

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STONE IN THE URINARY TRACT: PRESENT CONCEPTS OF ETIOLOGY AND PREVENTIVE THERAPY AGAINST RECURRENCE.*

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Scientific approach to a better understanding of the pathogenesis of urinary calculi received impetus in 1917 when Osborne, Mendel and Ferry noted a high incidence of concrement formation in rats fed on a diet deficient in vitamin A. Since that time the experimental production of urinary stone has been accomplished by numerous investigators with such widely different methods as to lead to difficulty in evaluating their significance.

HYPEREXCRETION CALCULOSIS

From the chemist we learn that water insoluble constituents of stone are held in solution by irreversible protective colloids, and, further, that their solubility varies with the hydrogen ion range of the urine.

The first experimental calculi in animals were produced by Ebstein and Nicolaier in 1893 by feeding oxamide. In 1920-21, I traced the histogenesis of oxamide calculosis, paying attention to the crystalline morphology and to the content in urinary pigment.

It was found that small doses of oxamide caused a deposition of an isolated cross type of crystal, whereas large doses resulted in profuse hyperexcretion of pigmented stone forming spherular crystals.

The production of artificial calcium oxalate stone by the hyperexcretion mechanism was next achieved by injecting subcutaneously N-butyl oxalate and calcium chloride in chemically equivalent amounts. In tracing the histogenesis of such calculi from urinary sediments and crushed stones, we found the concrement forming crystal again to be made up of a spheroidal crystalline form which agglutinated together to form stone.

Hyperexcretion calculosis may be explained by the inability of the urinary protective colloids to maintain solution of the excessive crystalloid material present or to deposit it as single discrete crystals.

Clinically, the evidence for hyperexcretory calculosis is abundant. Phosphaturia, oxaluria and uratic showers in gouty disease are known to be frequently associated with stone. Cystin calculi occur with the excessive appearance of an abnormal crystalloid in the urinary tract.

The high incidence of calcium phosphate calculi associated with hyperparathyroidism is especially illuminating. Here we have an excessive parathy-

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roid secretion, with consequent hypercalcemia, hypophosphatemia, hypercalcinuria and hyperphosphaturia. In short, there is intense hyperexcretion of calcium phosphate. Hyperexcretory calculosis

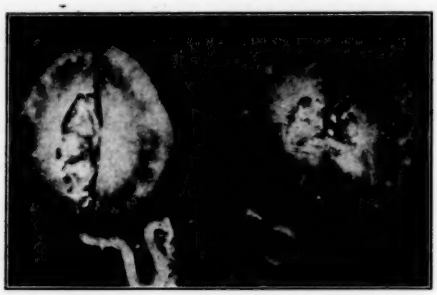

Fig. 1—Bilateral lithiasis in a rabbit fed oxamide daily for seventeen days; larger masses lie behind the free margin where the calices are attached to the renal parenchyma.

thus approaches the point of establishment as a clinical entity, the chemistry of the stone with concomitant studies of the blood and urine leading to its possible diagnostic recognition.

ENCRUSTATION CALCULOSIS

However, not all calculosis is to be explained on the basis of crystalline hyperexcretion. Rosenow and Meisser in 1923 produced calculi in dogs by dental implantation of streptococci recovered from apical abscesses of patients suffering with stone. Hegar and Magath in 1925 introduced proteus ammoniae from the urine of stone-forming patients

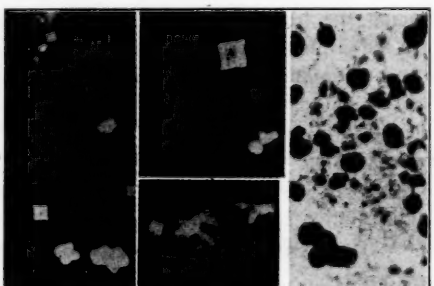

Fig. 2—Oxamide crystals as observed in urine under the influence of the urinary colloids. These crystals have assumed a morphology altogether different from the synthetic form. We can trace the evolution of crystals through non-coalescent crosses, crosses with interbrachial spaces partly filled out, squared forms and coalescent spheroids.

into the bladders of rabbits with resultant calculosis. Hryntschak and Hellstroem have had similar results from intravenous injection of staphylococci isolated from urines of patients with lithiasis.

In 1932 and 1934, with streptococci isolated from the urines of two extremely rapid stone-forming patients, I produced and studied calculus formation in rabbits. The organisms were introduced intravesi-

Fig. 3—Calcium oxalate stones in bladder. Result of intense oxaluria produced by injection of normal butyl oxalate and calcium chloride.

cally after a mild chemical cystitis had been produced with 1-1000 alcoholic salicylic acid solution. Intense alkalinization of the urine with an abundant

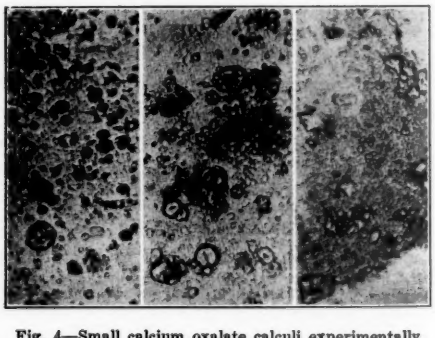

Fig. 4—Small calcium oxalate calculi experimentally produced as in text, crushed on slides to show crystalline elements in structures. Note that the small fusing spheroids constitute the structural units.

amorphous sediment of carbonates and phosphates occurred. The initial lesion was found to be an inflammatory necrosis of the vesical mucosa. The

surface cells became impregnated with lime salts. From this encrusted surface particles subsequently became broken off, with the formation of sand and free calculi.

During the past two years we have undertaken a histologic study of human kidneys removed for calculous pyonephrosis. Blocks of tissue several mm. thick were cut from areas in the calyces and pelvis contiguous to the calculi. The stone and all loose sand fragments were thoroughly washed away in running water and the tissue placed in 10 per cent formaldehyde. On staining sections from these

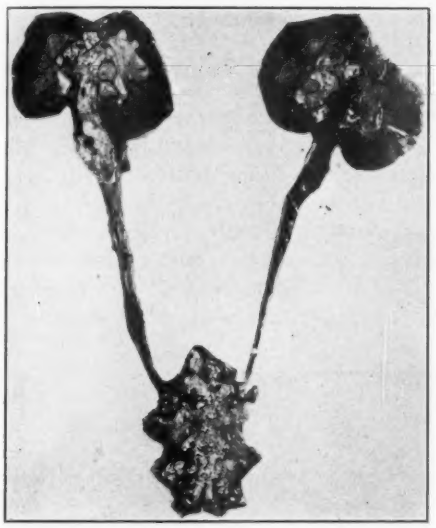

Fig. 5—Intense calculosis from infection with streptococci from urine of rapid stone forming patient. Note encrusted cystitis, dilated ureters, and pyonephrosis. Multiple concrements in bladder and both kidneys. Rabbit. Experiment X. Five weeks after infection.

blocks by Von Kossa's silver nitrate method, lime salts were found lying within and on the surface of cells of the terminal portions of the collecting tubules and papillae. Here and there a tuft of lime impregnated cells appeared to be in process of being broken off to form the seed for growth of a definite calculus. This histologic study corresponded in every detail to that observed in rabbit's bladders with experimental streptococcic calculosis.

I have described this mechanism as "encrustation calculosis". Its action is apparently more local in the urinary tract than that of hyperexcretory calculosis, where both experimentally and clinically there is an apparent tendency to produce calculi bilaterally and at many points simultaneously.

Clinically the association of infection with lithiasis needs no elaboration. Abundant evidence supports the view that urea-splitting organisms are most frequently at fault in producing alkaline carbonatic and phosphatic stone. Rovsing feels that infection accounts for 71 per cent of recurrences and goes so far as to advocate nephrectomy when a urea-splitting stone-forming organism is found to persist on one side. The bacteriologic specificity of these organisms to form stone is borne out by the experimental work where each observer has found negative results when non-specific strains were used.

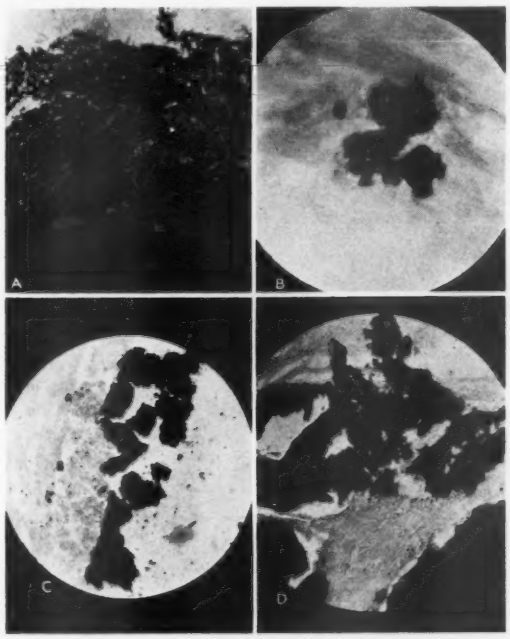

Fig. 6—Histogenesis of experimental encrustation lithiasis produced by infection with streptococci. A. Rabbits bladder showing beginning of lime salt deposit in necrobiotic epithelium. B. Growth of calcified mass within and upon epithelial cell. Note intracellular deposits of calcium on effete epithelium. C. Further growth of process with breaking off of fragments. D. Fully developed encrusted cystitis from which calculi arise.

VITAMIN DEFICIENCY LITHIASIS

We must consider briefly the work of those who hold for a vitamin deficiency as a cause of stone. The experimental work of Osborne, Mendel and Ferry, of Van Leersum, Fujimake, McCarrison and Higgins is well known. It appears that rats, Dalmatian dogs and chickens will develop urinary calculi when starvation of vitamin A is carried out to such an extent that extreme malnutrition is produced.

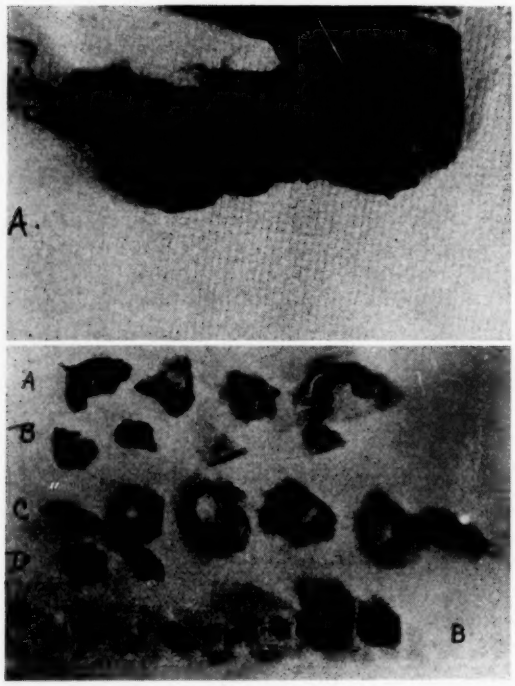

Fig. 7—Histogenesis of calycal calculus in human kidney. A. Calculous pyonephrosis in human kidney, area surrounding calycal stone. B. Sections of tissue surrounding calycal stone. Removed and washed free of all gross calculous particles. Microscopic sections made from these areas in quasi serial manner are stained with Von Kossa stain for calcium phosphate.

The geographic incidence of stone, its frequency in bladders of male children in certain endemic areas, the decreased incidence of calculus as a result of better dietetics as brought out by Mr. Joly, the high incidence of stone in Florida and California as shown by Holmes and Coplan, its usual absence in the meat-eating negro,—all of these features have been explained on the basis of dietary content in vitamin A.

While I suggested the use of vitamin A in the treatment of lithiasis as early as 1930, I still feel that its place as a specific therapeutic agent for stone has not yet been established with scientific exactitude. My reasons are these:

1. Patients with stone do not present the excessive vitamin A deficiency which is necessary to form calculi in animals.

2. We have seen stones grow in size and have seen recurrences during intensive vitamin A administration.

3. Chronic non-calculous infections are not appreciably affected by vitamin therapy.

4. Animals with experimental hyperexcretory and encrustation lithiasis of infectious type are not protected by vitamin A.

5. The use of acid diet and drugs, such as will presently be described, with vitamin A precludes the scientific evaluation of this vitamin as a specific for stone.

However, the salutary effect of vitamin A on epithelial structures is accepted by authorities on nutrition and one cannot say it is without value.

I have come to regard vitamin A therapy in lithiasis much as I regard it in the treatment of respiratory infections, a good tonic but by no means a consistently effective prophylactic.

THE FACTOR OF THE URINARY REACTION

The H-ion concentration is a great factor in aiding the urinary colloids to maintain solution. Each constituent of stone has its ideal range for chemical precipitation, this being modified by the urinary dilution and the quantity of colloid and crystalloid present, factors constantly varying under normal conditions. The urates, oxalates, crystalline, carbonates and phosphates tend to form in urines of relative neutrality or acidity. The alkaline phos-

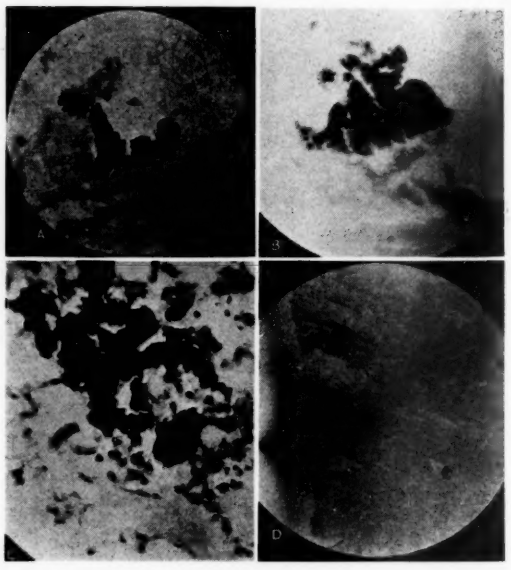

Fig. 8—Histogenesis of calycal stone in human kidney. A calcium deposits within and upon calycal epithelium. Note lime deposits within and upon epithelial cells. B. Growth of epithelial calcification into lumen. C. Extensive lime impregnation. Note especially how calcium salts fill up cells with moth eaten or wavy appearance at margin corresponding to area of cytoplasm in effete epithelium where lime is being deposited. D. Isolated areas of calcium deposit within cellular tissue adjacent to calyx.

phate and carbonate stones tend to form in infected strongly alkaline urines. Some consider the intense alkalinity itself as the probable cause of such stone deposition. Lithiasis has been noted in patients on alkaline ulcer diets. However, all ranges of pH are noted normally in animals and man with deposition of crystalline sediments corresponding to the range. Stone is almost always absent. Some factor other than alkalinity alone seems necessary before stone will form.

Fig. 9—Marked deposit of oxamide in left kidney of a rabbit fed oxamide nine days as the result of low-grade stasis caused by rubber band around the left ureter. The untreated right kidney is clear.

THE FACTOR OF UROSTASIS

Urostasis has been considered a possible cause of stone. Certainly it is so frequently present without stone that we cannot accept it as a primary factor. In maintaining infection and promoting stagnation, however, urostasis becomes a matter of great moment. When the stone-forming process is present, when lime salts are being deposited on effete cells, or the crystalline coagulation of hyperexcretion is taking place, it is easy to understand how urostasis augments the retention and growth of stony particles.

An experiment with oxamide lithiasis affords an excellent physical demonstration of the action of urostasis. A rubber band was placed around the left ureter of a rabbit so loosely as not to interfere with renal secretion. This, as a foreign body, irritated the ureter slightly, thus producing a minimal degree of urostasis. On feeding small amounts of oxamide, concretions were consistently noted in the pelvis of the treated left side, whereas the pelvis of the untreated right side remained clear. Other experiments, in some of which the kidney pelvis of one side was traumatized by needle punctures, and in some, where fragments of muscle tissue were placed in one pelvis, produced similar results.

The role of urostasis in maintaining infection is a principle so well established and the removal of urinary obstruction in the therapy of infection so widely advocated that I shall not stress the point further at this time.

RARER TYPES OF CALCULI

Stones associated with injuries and disease of bone and with injuries of the spinal cord come up for consideration. Whether due to neurotrophic factors, stasis, or upsets of calcium metabolism has not yet been determined.

Fibrin calculi, bacterial calculi, cystin, xanthin and indigo types are occasionally found. The mechanism of their production is also elusive. Theoretically, fibrin stones may arise from the simultaneous precipitation of fibrin, an irreversible colloid, and of calcium salts such as occurred in Schade's test tube experiment. Bacterial clumps become encrusted with urinary salts, while cystin, xanthin and indigo stones owe their genesis to errors in metabolism and simulate hyperexcretory stone in type.

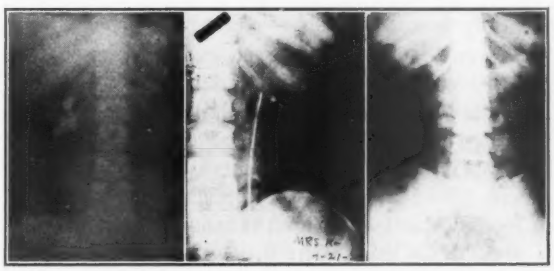

Fig. 10—Large carbonatic calculous pyonephrosis in right kidney treated by nephrectomy. Recurrence in left kidney after thirty days. Streptococcic infection. Reduction in size of calculous mass with two small fragments remaining after thirty days of urinary acidification and pelvic lavage with phosphoric acid.

From this background we must conclude that stone is not a disease entity. Rather it is a physical manifestation of crystalline matter, i. e., a change in form, which results from several physico-chemical mechanisms. Two of these mechanisms, viz., hyperexcretion of crystalloids and encrustation of necrobiotic epithelium with lime salts seem to have been definitely established on experimental and

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clinical grounds. Doubtless there are and must be many other mechanisms yet to be determined in order to explain the manifold aspects which stone disease may assume.

THE PURPOSIVE DISSOLUTION OF URINARY CALCULI

Crowell first demonstrated dissolution of urinary calculus when he caused recurrent cystin calculi to dissolve by intense urinary alkalinization and cystoscopic lavage with alkaline drugs. Randall was next able to dissolve encrustations and small stones of alkaline type by lavage with dilute phosphoric acid, a method which continues to be applied with satisfaction in selected cases.

In 1932, I attempted in several instances to shift the urinary reaction to the acid side in an effort to dissolve alkaline stones. Dilute aqua regia, the ketogenic diet and ammonium chloride and nitrate were first employed. We then began the use of acid and basic diets as means of changing the urinary reaction. Using these agents, I was able to report in June, 1933, with X-ray demonstration the first case of partial dissolution of a carbonatic calculus by means of urinary acidification. To date I have been successful in causing seven cases of alkaline stones to disintegrate by urinary acidification. In one of these two fragments persisted and required operative removal.

In this connection the study of dissolution of surgically removed calculi in weak acids *in vitro* has been interesting. Most carbonatic and phosphatic stones become soft and disintegrate on their surfaces but soon a harder resistant layer is encountered upon which the acid fails to act. Several stones removed operatively after attempts at dissolution, likewise proved resistant to dissolution in the test tube. From this we learn that softer sandy concretions will probably be more easily dissolved than the harder more compact varieties which cast dense discrete shadows in X-ray.

Uratic calculi are usually formed in acid urine so that further acidification would seem illogical. For this reason, if the urine is acid at the beginning we have reversed the procedure and given alkaline drugs and diet. I have two cases of disintegration of stone with alkaline therapy, in both instances the fragments passed being found to be uratic in composition. For cystin lithiasis also, alkalinization is indicated.

The principle of the acid base shift in stone dissolution has been variously employed by myself and others with variable results. From personal experience I could cite numerous instances of failure. Indeed, this principle is not always easy of intelligent application. Each case must be studied individually. Certain uratic and oxalatic calculi, fibrin types and phosphatic varieties are found with acid and alkaline, with infected and uninfected urines. No single dietary or drug therapy can be expected to give consistent results. Each case must be studied individually. Stones are almost always more or less mixed in chemical composition. This varies with the previous diet, individual metabolic trends and consequent variation in the amount of crystalline stone-forming material excreted. The urinary dilution, the quantity and kind of colloidal matter present, the H-ion concentration, factors constantly changing from hour to hour during the day come into play. Only within narrow limits can we ever attempt to control them clinically.

PREVENTION OF RECURRENCE OF URINARY CALCULI

Perhaps the most practical problem which faces the urologist is prevention of recurrence of stone after surgical removal. In 1930 I attempted to outline a therapeutic program for the prevention of recurrence. In 1933 this had assumed a more definite form and with certain modifications these principles of treatment are advocated today. I outline them as follows:

1. *Care to remove all stones and fragments as far as possible by surgery or cystoscopy.*—At operation, fluoroscopy or immediate kidney X-ray should be used and the avoidance of exposure of suture material to the urinary stream practiced. Stones and fragments left at operation can hardly be classified as recurrence. In badly infected kidneys, nephrostomy may be of value in preserving renal tissue.

2. *Qualitative chemical examination of the calculus removed.*—This should be carried out immediately. A quantitative examination of the various constituents would be ideal, but is hardly to be offered by the average clinical laboratory. I have in previous writings presented an outline which can be carried out in any clinical laboratory and which has proven of value in my own experience.

3. *Repeated X-ray immediately and at periods of six months to one year should be practiced.*—With smaller recurrences dissolution or removal by cystoscopic means may be possible.

4. *Correction of demonstrable metabolic errors.*—A careful study of the patient's metabolism should be carried out with every feature of laboratory diagnosis available. The blood uric acid, the serum calcium, phosphorus, and phosphatase determinations seem especially important data which we should routinely and repeatedly secure if we are to properly evaluate the incidence of hyperexcretory calculosis. If hyperparathyroidism is suggested, X-rays of the bones and other data pertinent to this disease should be determined. If hyperparathyroidism is demonstrated, surgical investigation of the parathyroid bodies is indicated.

5. *Dietary regulation.*—Dietary regulation assumes two aspects. First, the administration of a diet which will deplete exogenous supply of the stone-forming material, e. g., a low purin diet in uratic calculi, or a low oxalate dietary in oxalatic stone. Second, a dietary such as the acid or alkaline ash type with attempts to change the urinary

Measures Suggested in Preventive Therapy of Recurrence of Urinary Calculi

WITH COMMENTS ON THE TREATMENT OF URINARY INFECTIONS

Stones should be removed surgically or cystoscopically when possible. Dissolution of large dense calculi unlikely with present methods.

A. Chemical analysis of stone removed.

A SIMPLE METHOD FOR THE QUALITATIVE ANALYSIS OF URINARY CALCULI

(Modified from Hawk and Bergeim—Physiologic Chemistry, and Hammarsten-Lehrbuch der Phys. Chem.)
Domanski—Jr. Urol. Mar. 1937.

Each of the concentric layers of the calculus must be subjected to separate analysis. Material for examination is obtained by sawing the calculus carefully thru the nucleus, then separating the layers, or by scraping off from each layer (without separating the layers) enough powder to conduct the examination as outlined below. Seek nucleus separately with care. Study microscopically for organized organic matter (cells, bacteria) or foreign body.

On Heating the Powder on Platinum Foil, it*						
Does burn	Without flame	The powder gives the murexide test.**	The powder when treated with KOH gives***	No Noticeable Ammonia Reaction Add conc. HNO_3 to powder—No gas evolved.	Uric acid.
				Strong Ammonia Reaction Add conc. HNO_3 to powder—Evolution of gas (oxides of nitrogen).	Urates (ammonium, calcium, magnesium)
		Does not give murexide test.** The powder dissolves in nitric acid without effervescence. The dried yellow residue becomes orange with alkali, beautiful red on warming.			Xanthine.
	With flame	Flame pale blue, burns a short time. Peculiar sharp odor. The powder dissolves in ammonia, and six-sided plates separate on the spontaneous evaporation of the ammonia.			Cystine.
		Flame yellow, pale, continuous. Odor of resin or shellac on burning. Powder soluble in alcohol and ether.			Urostealith
		Flame yellow, continuous. Odor of burnt feathers. Insoluble in alcohol and ether. Soluble in potassium hydroxide with heat. Precipitated herefrom by acetic acid and generation of hydrogen sulphide.			Fibrin
Does not burn	The powder when treated with HCl	Does not effervesce		Effervesces	Calcium carbonate.
		The powder gently heated, then treated with HCl		Effervesces Filter—Make alkaline to litimus with 15% NH_4OH sol.—Then just acid with 5% acetic acid—Let stand 1 hour—centrifuge and examine for crystals of calcium oxalate:—or treat sediment with N/ H_2SO_4, heat and add drop 0.01 N-$KMNO_4$. Decolorization of permanganate indicates calcium oxalate.	Calcium oxalate.
			The powder when moistened with a little KOH	No ammonia or, at least, only traces of ammonia. Powder dissolves in acetic acid or HCl. This solution is precipitated by ammonia (amorphous precipitate).	Bone-earth (magnesium and calcium phosphate).
				Abundant ammonia. The powder dissolves in acetic acid or HCl. This solution gives a crystalline precipitate with ammonia.	"Triple phosphate" (mixed with unknown amount of earthy phosphate)

*Flame test frequently imperfect with small amounts.

**Murexide Test

To a small amount of the powder in a small evaporating dish add 2-3 drops of concentrated nitric acid. Evaporate to dryness over a very low flame or water bath. A red or yellowish residue remains which turns purplish red after cooling the dish and adding a few drops of very dilute ammonium hydroxide. The color is due to the formation of murexide.

***KOH frequently fails to liberate appreciable ammonia.

Most stones are mixed in composition.

Rapidly recurrent stones tend to be pure and relatively unmixed and of the same composition as their predecessors.

reaction to the point of maximal urinary solution of the stone-forming chemical. Combinations of the two may be and should be attempted.

As for uratic calculi, the consistency with which these stones are associated with a hyperexcretion of uric acid is not known. However, intense urinary alkalinization is attendant upon disappearance of urate crystals from the urine. Therefore, a low

B. **Blood chemistry studies—**

Blood uric acid—serum calcium—blood phosphorus. (Repeat several times.)

C. **Uratic calculi—Low purine diet*—**

Intense alkalinization of urine.

Calcium oxalate calculi—

Low oxalate dietary* Intense acidification of urine. Give Vitamins B and D to decrease oxaluria.

Calcium oxalate is precipitated in a wide range of urinary reaction. Best solution is maintained at pH 5.2, poorest at pH 6.1 (Maslow). This is most difficult stone to dissolve or to control by urinary reaction.

Calcium carbonate and calcium or ammonium magnesium phosphate calculi.

Low phosphate dietary.* (Especially avoid milk and dairy products. Probably high acid ash diet better).

Intense acidification of urine. (pH 4 to 5).

Cystin calculi—

Intense alkalinization of urine.

*An excellent series of diets are listed in an article by Grant and Simpson—Southern Medical Journal—July, 1930. Also consult Barborka, Treatment by Diet, Lippincott, 1934.

For H-Ion Determination Use Indicator with Color Card such as LaMotte Duplex Indicator (LaMotte Chem. Products Co., Baltimore).
or Use Methyl Red Paper { Red—pH below 5.5; Yellow—pH above 5.5. (approx.)
Coleman & Bell
or Nitrazine Paper { Yellow—pH below 5.3; Green—pH above 5.3.
or 0.04 percent chlorphenol red—1 drop to 20 drops urine { Red—pH 5.2; Pink—pH 5.5 to 5.8.
— Patient May Be Taught To Use These —

D. **To acidify urine—*ACID ASH DIET*—(see next page).**

Dilute nitrohydrochloric acid (aqua regia).

℞ Conc. nitrohydrochloric acid ..... 10 cc.
Distilled water q. s. ..... 100 cc.

Sig: Take 1 drachm in 1 glass water q. 1 to 2 hrs. to tolerance. Sip through tube and rinse mouth with sodium bicarbonate solution after taking. Care not to swallow bicarbonate solution.

Or Use *ACID DIURETIC MIST.*

℞ Ammonium benzoate .....Dr. II
Ammonium chloride .....Dr. III
Ammonium nitrate .....Dr. III
Saccharose .....Oz. IV
Elixir of Lactated Pepsin q. s. .....Oz. VIII

N. B.—Mix in mortar to syrup.

Sig: Drachms one to two in glassful water every one to two hours unless nauseated.

Each drachm contains 0.5 gm. of acidifying drug.

This syrup is usually well tolerated and has been found the best urinary acidifier in our experience. It may be used together with—

Enteric coated tablets—Ammonium Chloride—6 to 10 gms. daily

Enteric coated tablets—Ammonium Nitrate—6 to 10 gms. daily

Watch stool to be sure enteric coated tablets are absorbed.

The use of the acid diuretic mixture, dilute aqua regia, enteric coated tablets, and acid ash diet singly or simultaneously has generally been well enough tolerated to render acid resistant urinary alkalinity. If patient is nauseated omit one or two doses and continue. When 8 to 10 gm. acidifying drug are exceeded in 24 hours watch for systemic acidosis. Certain types of urea splitting organisms, e.g., proteus and some staphylococci defy urinary acidification. Acid urine is possibly secreted, but is at once alkalinized by bacterial action.

LACTIC OR HYDROCHLORIC ACID MILK (10 to 60 drops of lactic or dilute HCl to 6 oz. boiled milk)—1 glass 4 times or more daily. Useful in infants and children.

E. **To alkalinize urine—*ALKALINE ASH DIET*—see next page.**

ALKALINE DIURETIC MIST.

℞ Kali citratis .....Oz. I
Sodii bircarbonatis .....Dr. IV
Syr. Orange .....Oz. IV
Aquae Dist. q. s. .....Oz. VIII

Sig: Drachms III in water a.c. and h.s.

Magnesia, potassium citrate or acetate, sodium bicarbonate in suitable prescription.

F. **TO TREAT THE URINARY TRACT INFECTION—**

SMEARS AND CULTURES at Initial Urologic Examination.

Study voided and catheterized bladder urine, catheterized ureteral specimens from each kidney, determining pH on usual dietary.

Differentiate infectious organisms by laboratory methods. (Gram stain simple and useful.)

NEOARSPHENAMINE—0.2 gm. intravenously followed in 5 to 7 days by 0.3 gm.

Frequently of value in staphylococcus and streptococcus fecalis. Do not continue if first two doses show no improvement. Use cautiously in acute infections and with renal insufficiency.

METHENAMINE—Keep urinary reaction below pH 5.6. Push dosage to tolerance 4 to 8 gm. daily. Watch urine for increase in red cells or casts. Do not continue large doses over long period. Drop maintenance dose to 3 to 4 gm. daily. If not effective after several days do not continue. If given intravenously calculate amount in total daily dosage.

ACRIFLAVINE—CAPROKOL—AZO DYES (Pyridium, Serenium, etc.). Seldom sterilize urine, but good bacteriostatics and reduce infection.

purin alkaline ash diet is theoretically ideal for uratic stone.

Oxalatic calculus presents a problem. Exogenous sources should be excluded by low oxalate dietary. However, as Neville has pointed out, the source of oxaluria is probably endogenous, being associated with vitamin B—D deficiency. Oxaluria may be corrected by administration of these vitamins.

KETOGENIC DIET—References—Clark, A. L. J. A. M. A. 107: 1280-1284-1936. Nesbit, R. M. J. A. M. A. 105: 1183-1184-1935.

Not well tolerated in many patients. Used less frequently now as mandelic acid in most instances affects same organisms more successfully and is better tolerated. Bacillary and streptococcus fecalis infections respond best, coccal infections poorly except at times in lower urinary tract.

MANDELIC ACID—Has largely replaced ketogenic diet. Keep urinary concentration high by restricting fluids to 1000 to 1200 cc. daily (except in acute cases). Keep pH by acid-ash diet and drugs at pH 5.2.

Give 12 gm. mandelic acid daily to adults (as sodium mandelate or ammonium mandelate). Infants and children according to age. Do not continue over two or three weeks and examine urine carefully for appearance or increase of red cells and casts. In cases of renal insufficiency take care not to produce acidosis. Watch for nausea, vomiting, hyperpnoea and check CO_2 combining power of blood.

SULFANILAMIDE—In urinary tract effective for bacilli including proteus. Does not affect cocci so well. Streptococcus fecalis does not respond.

Active (probably most active) in alkaline urine. Keep pH at 7.5 or higher. Develops bactericidal urine in renal insufficiency. At present oral administration appears equally or more effective than intramuscular or intravenous routes. Secreted in poor concentration in prostatic secretion, but very effective in prostatic infection. Dosage not standardized—Start with 60 to 80 grains daily in four doses. Reduce to 40 grains daily after 2 or 3 days.

Watch tolerance of patient and for many bizarre untoward reactions—Progressive cyanosis, hemoglobinuria, hematuria, hyperpyrexia, leucopenia, agranulocystosis, erythraemia, dermatitis, anemia, jaundice and retinitis indicate discontinuance of drug. Usually prompt recovery from toxic symptoms ensues. Do not give any type of sulphates and especially avoid magnesium sulphate during sulfanilamide administration. Watch patient daily.

REDUCE FOCAL INFECTIONS—teeth—tonsils—prostate—cervix—alimentary tract.

SURGICAL DRAINAGE—Nephrostomy—Seminal Vesiculotomy—Cystostomy—Removal of prostatic obstructions—Suspension of kidney, etc.—when indicated.

UROLOGIC DRAINAGE—Indwelling catheters—Periodic cystoscopic, ureteral dilatation. Dilatation of small calibered urethras. Valuable measures if applied gently and increasing size of dilator gradually. Avoid trauma.

Lavage with 1 to 2% phosphoric acid, etc. Continuous irrigation with acids by any method is not tolerated by most patients and may provoke severe reactions. Of value chiefly in post-operative effort to prevent recurrence of stone.

SUMMARY:

Surgical removal of stone usually indicated when possible. Adjust urinary reaction in accordance with chemistry of stone. Correct metabolic error—hyperparathyroidism, uric acid, oxalate, phosphate hyperexcretion. Reduce infection. For coccal infections use neoarsphenamine and methenamine. For bacillary infections and streptococcus fecalis use urinary acidification and mandelic acid. In alkaline bacillary infections use sulfanilamide. Remove focal infection. Establish drainage.

Patients with bone disease (fractures, infections, tumors, osteitis deformans, osteitis fibrosa cystica); patients with spinal cord injuries or patients long bedridden—keep urine at acid range (pH 5 to 5.2) as prophylaxis against stone.

G. Increase Vitamin A Intake—Sources—Cod liver oil—Haliver oil—Carotene (Provitamin A).

FOODS—

APRICOTS	CHEESE	Oysters	Vegetables with green or yellow pigment, as		
BEEF LIVER	(Am. or Swiss)	Peaches	Asparagus	CRESS	Sweet Potatoes
Beef Fat	CREAM	Pineapples	Beans, green	LETTUCE	Squash
BUTTER	EGG YOLK	Prunes	Cabbage	PEAS (green)	SPINACH
Bananas	Kidneys	Tomatoes	CARROTS	Peppers	TURNIP (tops)
Cantaloupe	Milk		Corn (yellow)	Pumpkins (yellow)	
CHARD	Oranges				

ACID-ASH DIET

(Expressed in cc. Normal reagent per 100 gm. food)

This diet is deficient in Vitamin C. For this reason Vitamin C vegetables of low alkaline-ash content may be added periodically if the patient is on the diet for a long time.

Egg Yolk	27.	Pork, lean	10.	Crackers, soda	8.3	Bread (rye)	4.9
Oysters	15.1	Veal, loin	9.8	Pork chops	8.	Corn Meal	4.9
Macaroni	14.3	Ham, smoked	9.7	Walnuts	7.8	Peanuts	3.9
Shredded Wheat	12.2	Sponge Cake	9.0	Bread, whole wheat	7.3	Corn, green	1.8
Whole Wheat	12.	White Flour	9.0	Bread, white	7.1	Cranberries, Plums,	
Oatmeal	12.	Beef, ribs, lean	9.6	Perch	6.3	including Prunes	
Sardines	11.3	Mutton, leg	9.6	Corn, (dry)	5.9		
Eggs, whole	11.	Soy bean Meal	9.5	Cheese, Cheddar-		NEUTRAL	
Beef, porterhouse steak	10.9	Rice	9.3	(American)	5.4		
Chicken	10.7	Halibut, fresh	9.3	Egg White	5.2	Tapioca Lard	
Salmon, canned	10.7	Flour, white	9.0	Lentils	5.1	Butter Sugar	
Barley, pearl	10.4	Trout, salmon	8.8	Swiss Cheese	5.	Cream Cornstarch	
Beef Liver	10.5	Cod fish	8.4	Bacon	5.	Oil	

ALKALINE-ASH DIET

(Expressed in cc. of Normal reagent per 100 gm. food)

Molasses	56.	Citron	9.6	Bananas—C	5.6	Raspberries—C	3.8
Olives	45.6	Rutabagas—C	8.5	Oranges—C	5.6	Apples—C	3.7
Dried Figs	32.9	Rhubarb—C	8.5	Tomatoes—C	5.6	Pears, fresh	3.6
Spinach	27.0	Cucumbers—C	7.9	Beans, fresh string	5.4	Radishes—C	2.9
Raisins	23.6	Celery—C	7.8	Condensed Milk	5.2	Watermelon—C	2.7
Beans, dried	18.	Cantaloupe—C	7.5	Evaporated Milk	5.3	Turnips—C	2.7
Dried Milk	18.	Lettuce—C	7.4	Cauliflower—C	5.	Milk, whole, raw	2.5
Chard	15.8	Potatoes, white—C	7.	Lemons—C	5.	Buttermilk	2.2
Beans, fresh lima	14.	Cocoanut	7.	Peas (dry)	5.	Onions—C	1.5
Almonds	12.3	Pineapples, fresh—C	6.8	Peaches, fresh—C	5.	Pumpkins—C	1.5
Parsnips	12.	Sweet Potatoes—C	6.7	Chestnuts	5.	Peas, fresh—C	7.3
Dates	11.	Cabbage—C	6.	Cherries—C	4.5	Asparagus—C	0.8
Beets, fresh	10.9	Baked Beans	6.	Mushrooms	4.	Grapefruit—C	alk.
Carrots—C	10.8	Apricots	6.	Grape Juice	4.	Ice Cream	0.2
Figs	10.						

C signifies high Vitamin C content.

While oxalates are precipitated in a wide range of urinary reaction, their solubility is perhaps better at a higher acid range. Therefore, a high acid ash diet, low in oxalates, and rich in vitamin B and D is to be given.

Phosphate and carbonate stones require a high acid dietary.

Cystin is held in solution in alkaline urines. Hence the basic diet is indicated.

6. *The forced administration of vitamin A.*—

SOFT ACID-ASH DIET

May have the following foods:

EGGS (poached, soft boiled, souffle, egg custard, shirred, creamed, omelet, scrambled).
MACARONI (creamed, buttered or cooked in chicken stock).
COOKED CEREALS (rice and grits may be served as vegetables or cereals, and oatmeal, cream of wheat, farina, and wheatena, also cornmeal as mush).
CRACKERS.
BREAD (whole wheat, rye and white).
CORN (green or canned, either very tender or run through sieve to remove outer skin).
DESSERTS (custard, rice puddings, tapioca custard, bread puddings—made with eggs and one-half milk and one-half 20% cream).
CHICKEN (stewed, creamed or baked).

Later may have:

Fresh halibut boiled, broiled or baked.
Fresh trout boiled, broiled or baked.
FRUITS (cranberries, plums (cooked) and prunes (may be combined with eggs as whips or souffles).
NEUTRAL FOODS (cream, butter, tapioca, sugar, cornstarch).

SAMPLE MENU FOR DAY:

BREAKFAST	LUNCH	DINNER
Prunes with cream. Oatmeal, shredded wheat with cream. Poached egg on toast. Toast with butter. Coffee or tea with cream and sugar.	Cream of chicken soup with crackers. Egg omelet. Buttered grits. Stale muffins (toasted with butter). Prune whip (made with stiffly beaten egg white, pureed prunes and sugar). Coffee or tea with cream and sugar.	Bouillon with toasted crackers. Stewed chicken with gravy. Steamed rice. Stewed corn. Toast with butter. Baked chocolate custard. Coffee or tea with cream and sugar.

SOFT ALKALINE-ASH DIET

FRUITS ALLOWED—(all fruits on list)—
Orange juice, pineapple juice, grapefruit juice, tomato juice, peach juice, apricot juice, pear juice.
Baked apple without skin, baked pear without skin, fresh or canned applesauce, canned peaches, pears, apricots, Royal Anne cherries.

VEGETABLES on alkaline list—
All vegetables must be **strained.** Carrots, peas, lima beans, butter beans, string beans, tomatoes, asparagus, spinach, beets, squash, baked potato, or mashed potato.

MILK AND MILK PRODUCTS ALLOWED—
Sweet or buttermilk, cottage cheese, cream, butter.
Any ice cream without solid fruits or nuts.
Chocolate milk or hot chocolate.

BREADS ALLOWED—
Toast (white or brown) **NOT MORE THAN ONE AND ONE-HALF SLICES EACH DAY.**

EGGS—Do not eat more than **ONE** egg a day.

DESSERTS (BESIDES FRUITS) ALLOWED—Simple puddings made with any of the allowed fruits—Baked custards, tapioca puddings.

COFFEE AND TEA—MAY BE TAKEN AS DESIRED.

Sugar, salt and pepper as desired.

SAMPLE MENU FOR DAY:

BREAKFAST	LUNCH	DINNER
Any allowed fruit or fruit juice. One egg. Milk. Coffee or tea. ½ slice bread (toasted).	Cream or vegetable soup. Baked potato. Vegetable purees. ½ slice toasted bread. Milk. Allowed fruit or dessert or both.	Fruit cup. Mashed potato. Vegetable purees. ½ slice toast. Milk. Dessert.

NOTES ON SOFT ALKALINE-ASH DIET:

In keeping a diet alkaline—eggs, which are one of our most valuable sources of protein in the soft diet must be very limited, so in order to keep the body built up a great deal of milk should be consumed.

The patient should take at least 1½ quarts of milk each day. This may be used in soups, specially-prepared drinks, or may be taken plain.

Notice that none of the foods allowed are limited in amounts except eggs and toast. These are limited because they contain acid properties.

While using vitamin A since 1930 freely, I have never showed the enthusiasm which many workers in this field have had. I cannot conceive cod liver oil or carotene to be more specific for stone disease than they are for the common cold. Nevertheless, the tonic effect of vitamin A or the epithelium of the body is indisputable and if well tolerated by the already much dieted patient, it should be given.

7. *The reduction of urinary infection and of focal infection.*—A persistent effort to eradicate or to reduce to a minimum the local urinary infection should be made. Initial and repeated bacteriologic studies of the urine, using cultures and smears, are imperative. The initial examination is perhaps most important. Oral antiseptic drugs may aid and the ketogenic diet or mandelic acid therapy may be tried with success. Neoarsphenamine in coccal infections is of value. Sulfanilamide gives brilliant results at times. Focal infection should be routinely attacked. Dental, tonsillar, prostatic, cervical, and alimentary tract infections demand especial care.

8. *The correction of urostasis.*—I emphasize that the chief object of attack is urostasis and I routinely practice periodic post-operative lavage with the free use of indwelling catheters and ureteral dilatation with bulbs. Lavage with phosphoric acid in 1 to 2 per cent solution may dissolve encrustation, sand, or minute calculi. The dilated ureter may afford passage to small concretions.

9. *Change of urinary reaction.*—The reaction of the urine should be shifted to the opposite of that which is ideal for the formation of the stone. This feature has been previously dealt with. The urine from each kidney should be separately studied with indwelling catheters. The patient should be instructed to make his own H-ion determination either with a LaMotte or similar indicator or with methyl red or chlorphenol red paper. There are several potential dangers in keeping the urine at an intensely acid or alkaline range over a long period of time. Systemic acidosis may be produced by too large or too long continued dosage of acid drugs and even nephritis can occur. Certain urines infected with urea-splitting organisms are most resistant to acidification therapy as the acid secreted urine is quickly alkalinized by bacteriologic action of these organisms. At times acidification by oral therapy is impossible. For this reason patients on such a regimen should be under constant observation by an understanding urologist who is familiar with this type of work. Chute has called attention to the fact that ammonium salts may actually form a source of food for urea splitting organisms if urinary acidity is not attained and that urinary acidification will increase the elimination of calcium salts in the urine. Such calcium hyperexcretion may thus theoretically promote the growth of stone. Likewise, we must bear in mind that shifting the urinary reaction may only mean that a stone of different chemical composition may form.

In 1933, I reported sixteen cases of rapidly recurrent calculi which had had their cycle of recurrence broken in from one to nine years by the use of such measures. Since that time three similar cases have been treated successfully. The result of others, in this connection, are encouraging and serve to show that my own experience with a relatively small group of patients has not been erroneously interpreted.

SUMMARY

Stone is not a disease entity. Several mechanisms enter into its production. Two of these, viz., "hyperexcretion" and "encrustation" are described.

The reaction, the crystalloid and colloid content of the urine determine the chemical composition of the stone.

The genetic factors in lithiasis of rarer types are unknown.

Dissolution of calculi by the acid-base shift may be accomplished at times. However, the limitations of the method are definite.

Prevention of recurrence of calculi can be attained in the majority of cases following a therapeutic program such as is described.

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DISCUSSION

DR. JOSEPH F. GEISINGER, Richmond: I have welcomed the privilege of discussing this paper, more particularly because it offers to me an opportunity I have long desired to express publicly to Dr. Keyser my appreciation of the very noteworthy work he is doing in this field. Certainly it is very pleasing to realize that one of our own members has come to occupy a conspicuous position among the handful of physicians in the world who are contributing most to a solution of the vexatious problem of the etiology of urinary stone. Wherever this problem is discussed now, here or abroad, the name of Keyser must necessarily be quoted. I doubt if the Society is fully aware of this fact and it is well enough for some one to bring it to your attention.

As you have doubtless surmised from what Dr. Keyser

has just said to you himself, the etiology of stone is an exceedingly complicated matter and, while much work of great value and interest has been done, much remains to be done. It would be superfluous of me to attempt to review this portion of his admirable paper, as I could do no more than repeat his own words. Instead of this, I shall content myself with a single observation, namely, that when the final chapter in the etiology of stone is written—if ever—I feel very sure it will then appear that no single factor dominates this etiology, but that in fact there are present as many as perhaps a half-dozen factors which, in a given case, may act singly, conjointly, or in unison.

The remainder of Dr. Keyser's paper, which I regret the Society could not hear in full, introduces us to a consideration of the prevention of the recurrence of urinary calculi. Here we touch something of the greatest practical consequence for it is difficult to imagine a situation more disheartening than that of the patient who faces the knowledge that the stone which has caused him so much suffering and led him through the dangers and expense of a major surgical procedure has returned, leaving him as bad off as he was before—or worse. Such recurrence is not very common but it should be made still less common if by any human calculation or effort this can be brought about. Every stone case coming to surgery should be individualized and acutely studied with reference to visible etiological factors so that a post-operative period of oversight—often totally neglected—may be intelligently directed toward the elimination of these factors, which otherwise remain contributory to further stone formation. If there is a deficiency of vitamin A this should be supplied. A determination of the mineral elements entering into the composition of the stone will suggest certain dietary regulations, for whatever they may be worth. The reaction of the urine that has permitted or actually aided the formation of the stone should be changed to some other reaction. This will usually mean a change to the acid side, which is often easy, sometimes difficult, and occasionally impossible. Foci of infection must be eliminated and any tendency to stasis or to residual infection in the urinary system itself must be systematically attacked. The value of the ureteral catheter here is inestimable.

The direct introduction of acid into the pelvis of the kidney, mentioned by Dr. Keyser, has come into vogue comparatively recently and is a helpful and logical procedure in which I have a particular personal interest. Nearly twenty years ago I advocated this measure as an aid in the softening or dissolution *in situ* of certain types of calculi but proposed hydrochloric acid instead of the phosphoric acid now in common use. With the aid of the department of chemistry of the Medical College of Virginia, we undertook some modest research but our suggestions were coldly received in certain eminent circles, and, being then young and timid, I said no more upon the subject though I continued to use the acid from time to time.

Dr. Keyser did not mention, though I am sure he had in mind, the importance of one other step in the treatment which, in my own judgment, is probably of as much consequence as any other single detail—namely, the promotion of free water intake. With a tide of limpid urine continuously washing out the pelvis and with its own mineral content highly diluted, the development, as well as the recurrence, of calculus would certainly appear to be less likely.

When a program of this sort is conscientiously followed—with care at operation to remove all stones present (controlling this, if necessary, by the X-ray at the table), and with better realization by the surgeon that his duty does not stop here but includes careful post-operative direction and treatment—the incidence of recurrence will continue to fall, whereas the happiness and peace of mind of both doctor and patient will correspondingly improve.

DR. LAWRENCE T. PRICE, Richmond: I wish to join Dr. Geisinger in calling attention to Dr. Keyser's work in trying to work out the problem of the cause of stone. There is no subject in urology that has disturbed us quite so much as what causes stone formation. As Dr. Keyser brought out, every possible experiment has been worked out by first one and then another to determine the cause universally, but it seems that each case is an individual problem and what causes stone in one person may not in another. It is peculiarly noticeable that certain localities produce more stones than others; for instance, in India and in our own country, in the southern portion of Virginia, there are great numbers of stone-farmers. Up in this section, where you would think there would be stone, in this hard-water section, there seem to be relatively few.

I rose particularly to reiterate what Dr. Geisinger called attention to, and that is the great intake of water. There is no one thing that has as much bearing on the prevention of stone as the great intake of water. It is not the quality of the water that is important; it is the quantity. I remember very well Dr. William H. Taylor, in lecturing on chemistry, saying that a man goes to the springs and drinks a barrel of water to get a dose of lithia. This is quite true, but it is the washing out of the solid ingredients of urinary content that is important, the dilution.

The question of recurrence cannot be determined in each individual, but of course in each case the stone should be analyzed, and, as to whatever the chemical content is, that question should be dealt with directly. The alkalinization or acidification of the urine sometimes will solve the problem. But, after all, it is the intake of water, which most people ignore, that I think should be stressed.

DR. KEYSER, closing the discussion: The matter of urinary acidification merits a few further comments. Let me emphasize the point that the H-ion concentration of the urine from each kidney should be studied separately with the use of indwelling catheters. The urine from one kidney, especially if infected, may have an entirely different reaction from that of the opposite side. Hence a study of the bladder urine alone may be deceptive.

Again the danger of too intense or too long administration of acidifying drugs is hazardous as either systemic acidosis on the one hand or actual nephritis on the other can be produced. Even intense alkalinization over prolonged periods may bring about renal damage or a state of chronic alkalosis with unpleasant consequences.

As for fluid intake, I agree with the discussants that

forcing water is probably a good measure for the prevention of stone. I would emphasize, however, that the type of water, i. e., whether it is soft or hard does not seem a matter of great moment. Throughout history the effort has been made to link the etiology of stone with hard water. Yet the geographic incidence of stone does not bear out such an association. For instance, in Southwest Virginia, a limestone district, stone is not high in incidence, whereas in Florida, a region where the water is soft and the diet highly alkaline, calculus is relatively frequent.

As for dissolution of stone, I am quite in accord with the opinion expressed by Dr. B. H. Hager in a letter to the Urologists Correspondence Club. He states, "I should like to know how many members of our correspondence club have witnessed the disintegration of true, formed calculi. By this I mean solid stone made up of layers of concentric rings or laminations. It is my opinion that most if not all instances of spontaneous disintegration of kidney or bladder stones have occurred with soft stones or putty-like stones. They are composed chiefly of calcium magnesium phosphates and as far as renal stones are concerned represent a small minority. They often cast a very excellent shadow in the roentgenogram. The best examples are those found in the bladder. They are readily picked to pieces with a specimen forceps and are really not stones. I have often marvelled at the softness of these concrements in spite of their marked opacity to the roentgen ray. Such calculi do not dissolve, they merely disintegrate."

Indeed we are yet far from an understanding of the stone problem. However, each year brings a new group of observations, both clinical and experimental, from zealous workers in the field of research. It is not too much to expect that the knowledge derived from these observations will ultimately be fruitful.

APPENDICITIS: ITS DIAGNOSIS AND IMPROVED METHODS OF TREATMENT.*

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The importance of appendicitis is attested by its frequent incidence and its high mortality. It is a disease that can be promptly and satisfactorily cured by an early operation. A competently performed operation within the first few hours of the disease should result in almost no fatality. As it is, however, the mortality rate in the last census of the United States, which was for the year 1935, was 12.7 per 100,000 population, or 16,142 deaths. In Virginia, the death rate per hundred thousand population in the same year was 10.1, or 247 deaths. This rate has steadily increased, as shown by the fact that in 1913 the death rate per hundred thousand in Virginia was 6.4, or 137 deaths from appendicitis.

The late Dr. Murat Willis, in 1925, stated: "It is appalling to realize that the annual deaths from appendicitis equal all from salpingitis, pelvic abscess, surgical diseases of the pancreas, spleen, thyroid, gallstones and ectopic pregnancy. The annual toll taken by appendicitis almost equals the combined total of intestinal obstruction, gallstones and gastric and duodenal ulcer."

*From the Surgical Department of St. Elizabeth's Hospital, Richmond, Va.

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When we consider the splendid results following competent surgical treatment of appendicitis, it becomes necessary to emphasize not only early diagnosis but the treatment of this disease.

The symptoms of typical appendicitis are classical and make the diagnosis of such cases, which constitute the majority, relatively easy. Pain begins in the epigastrium or around the navel, comes on rather suddenly, is somewhat diffuse, and then settles in the right iliac fossa where the tenderness and muscle spasm are most pronounced. With the appendix in its usual location, this greatest point of tenderness is about McBurney's point, halfway between the anterior-superior spine of the ilium and the navel. Often there is nausea and sometimes vomiting, but usually there is no elevation of temperature in the early stages and the pulse is but little accelerated. As a rule, but not always, the white cell count is elevated, and a differential shows increased polymorphonuclears. A Schilling blood count may be helpful in showing a shift to the left when the white cell count seems otherwise normal. But these test may not be conspicuous in the early stages of appendicitis. As the disease progresses, a more rapid pulse with a rising temperature usually occurs. Then the white cell count may be elevated,

and the Schilling shift may be valuable, especially in children. However, any one who demands all of these symptoms or even a majority of them in every case will undoubtedly miss many diagnoses. Not infrequently the physical signs of pain and muscle spasm are present without any other change. The previous history is often illuminating, particularly if there have been spells of so-called "indigestion", stomach trouble, and general discomfort and slight pain in the lower abdomen.

Hertzler has very wittily asked why it is that, while the appendix may vary in its anatomical position anywhere from the under surface of the liver to the lower left abdomen or the cul-de-sac, the pain is always at McBurney's point? His answer is, "It is not". Too frequently a diagnosis of appendicitis is excluded because of the absence of many of the so-called typical symptoms and signs,—and too frequently a catastrophe follows.

As is well known, different individuals react differently from the same stimulus. There is undoubtedly, as Walter Hughson has demonstrated, a pylorospasm that may be induced in some persons by irritation anywhere in the peritoneal cavity. He has shown in dogs that cauterizing the cecum may produce a pylorospasm and slow the emptying of the stomach, which returns to normal when the gastric vagus nerves are cut. We have had some cases of appendicitis in which there was definite pylorospasm and hunger pain relieved by food, and a few in which roentgenologic examination, while it did not disclose a filling defect, was suggestive of a duodenal lesion because of the spasm, and in which the removal of a diseased appendix produced a cure.

These exceptional cases, however, should not constitute a license for removal of the appendix after vague abdominal symptoms unless the case has been thoroughly studied, but they are mentioned to show that the physician who first sees a patient suffering abdominal pain should have a catholicity of view and keep an open mind until a probable diagnosis has been established.

One of the most frequent variations from normal is pelvic appendicitis. Harold Brunn, of San Francisco, has called attention to this, and comments upon the symptoms of the condition. Brunn quotes A. R. Short, from the *British Medical Journal,* who, in speaking of appendicitis, says, "Difficulty in the diagnosis is caused by the pelvic appendix, both in children and adults. In the great majority of unrecognized and fatal cases of appendicitis, the appendix is of this type."

Pelvic appendicitis almost constitutes a clinical entity, as Brunn has insisted. Pain may be sudden and sharp, as in ordinary appendicitis, then it may become less marked. When the patient is first examined, however, usually there is no point of tenderness, and no muscle spasm. If the appendix is well down in the pelvis a rectal examination will disclose tenderness, especially with the finger high up in the rectum. Not infrequently these patients may have a constant desire to defecate, and there may be a diarrhea. Because of the adherence of the appendix to the bladder there may be frequency of urination, and the urine may actually contain some blood cells and leukocytes. The temperature is often about normal. When the pain can be localized it occurs as frequently on the left side as on the right. As the disease progresses the white blood cell count will usually increase. If the pain eases off after the first attack, the temperature is normal and the belly soft, with an absence of tenderness and rigidity at first, and often on the left side when it does occur, the clinical picture is very confusing.

In women pelvic appendicitis may be confused with salpingitis or a ruptured graafian follicle. A stone in the ureter must be differentiated, because often pelvic appendicitis will produce urinary symptoms and even pain in the penis.

The clinical examination in the early stage is extremely important. In these cases of pelvic appendicitis, because of the lack of typical symptoms, the attending physician is prone to keep the patient for observation until the appendix has actually ruptured.

In a recent patient of ours, the pain began immediately over the pubic region and the patient associated it with the menstrual period which was due and so she did not call a physician. There was no nausea or emesis. The pain continued above the pubis, and the following day there was also some pain in the left lower quadrant. This continued for another day, when the abdomen became distended and there was some tenderness in the right lower quadrant. The patient's temperature and pulse rate had remained about normal throughout. Examination on the third day after the first symptoms showed moderate distention and increased muscle tone throughout the abdomen. There was pain with muscle spasm in the right and left lower

quadrants, but somewhat more pronounced on the left. The white blood cell count was 10,750, with polymorphonuclears 85 per cent. The temperature was 99.2, and pulse 104. An immediate operation was done, and the appendix was removed. It had several perforations and was completely gangrenous. It was deep in the pelvis. There was spreading peritonitis. The patient's recovery was stormy at first but was eventually satisfactory.

At St. Elizabeth's Hospital we make a practice of operating upon every case of acute appendicitis or peritonitis from acute appendicitis as soon as the diagnosis is made. This, of course, simplifies matters so far as statistics are concerned, for all of our cases are included among those operated upon. If the operation is done at any stage gently and carefully, through a muscle-splitting incision, we believe the patient stands a better chance of recovery than if there is delay.

Peritonitis from salpingitis tends to be limited and differs greatly from peritonitis from a perforation in the gastro-intestinal tract, because salpingitis is usually caused by the gonococcus, whereas peritonitis from perforation of the gastro-intestinal tract is from the colon bacillus and some strains of streptococcus. The habits and reactions of gonococci are quite different from those of streptococci and colon bacilli. It has long been known that perforation of a peptic ulcer of the stomach or duodenum should be operated upon as soon as possible. The mortality rate from this perforation increases with the delay of operation, until after forty-eight hours practically all of the patients with freely perforating peptic ulcers die, whereas operation in the first few hours has a comparatively small mortality rate and drainage is not even necessary. In the stomach and duodenum the bacterial content is low, and it would seem much more important to close a perforation in the lower intestinal tract where bacteria are virulent and abundant. An appendicular abscess or peritonitis is from a perforation of the gastro-intestinal tract, as the appendix has been perforated either grossly or because of gangrene which permits bacteria to escape.

To be sure, patients do not die in the first eight or nine hours of peritonitis, but they may acquire an infection during this time which will inevitably be fatal after one or two days, when nothing can be done.

When there is peritonitis or an abscess from appendicitis, and drainage is necessary, the peritoneum is sutured with catgut up to the drain, but the rest of the wound is left open and packed with vaseline gauze for several days. With a McBurney incision the healing is better with this method than if more sutures were placed as the septic matter tends to pocket.

After an appendectomy, when the wound is closed, the patient is kept at rest in bed for eight or ten days. This would seem a minimum time for the wounds, both in the intestine and in the abdominal wall, to heal. Patients can, of course, get out of bed earlier than this, and in many instances no harm will come, but it is unphysiologic to expect a wound in the intestine and in the abdominal wall to heal firmly in less than eight or ten days, and the principle of rest is as important here as elsewhere. If there is drainage, naturally the residence in bed will be longer, depending upon the condition of the patient.

One of us (Dr. Guy W. Horsley) published a summary of cases operated upon at St. Elizabeth's Hospital, Richmond, for appendicitis from January 1, 1931, to January 1, 1935. This report did not include appendectomies which were incidental to some other operation. The summary showed 502 patients were operated upon, with four deaths. Since that report, and up to September 1, 1937, there have been 256 additional cases with one death, making a total of 758 cases and five deaths, a mortality rate of 0.66 per cent. These cases are classified as follows:

APPENDECTOMIES AT ST. ELIZABETH'S HOSPITAL
JANUARY 1, 1931, TO SEPTEMBER 1, 1937.

	Cases	*Deaths*	*Per-centage*
Acute appendicitis	470	3	0.64
Acute appendicitis with peritonitis	95	2	2.13
Subacute and chronic appendicitis	192	0	0
Carcinoma of appendix	1	0	0
	758	5	0.66

(During the month of September there were ten cases of appendicitis, with no mortality. This brings the total number of cases to 768, with five deaths).

Of the five deaths, one was from pulmonary embolus when the patient was about to leave the hospital. The patient had had a gangrenous appendix and was apparently in good condition following the operation. The second death was of a man seventy-two years of age who had a retrocecal

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appendiceal abscess. He died from pulmonary edema with a decompensating heart five days after the operation. The third fatal case was a woman thirty-four years of age who had acute appendicitis, and the appendix was removed; and there was also an abscess about the left tube adherent to the ileum, but not associated with the appendicitis. The abscess was drained and part of the ileum resected. The patient died five days after operation from intestinal obstruction and localized peritonitis on the left side. The fourth fatal case was a woman seventeen years of age who had been delivered normally three weeks previously and had complained of pain in her right side for four days. There was marked evidence of pyelitis. At operation there were a ruptured appendix and peritonitis, and three feet of gangrenous bowel. The appendix and the segment of bowel were removed. The patient died eight days later of peritonitis. The fifth death was in a man who was a chronic alcoholic with bad liver and kidneys, and was very fat. The appendix was removed. The patient developed paralytic ileus and uremia, and died on the sixth post-operative day. Necropsy showed no peritonitis.

In none of these fatal cases was the peritonitis caused solely by the appendix. There were two deaths in cases in which resection of the bowel was done.

There are five important points which we practice in the treatment of appendicitis:

1. Operate at any stage, whether peritonitis or abscess is present or not, as soon as the diagnosis is made.

2. Use the McBurney incision, be as gentle as possible in the manipulations, and always remove the appendix even if bound down in an abscess. We have not failed to remove the appendix in the last eleven years.

3. No sponging or packing of gauze around a septic appendix with an abscess or peritonitis. Suction, however, is freely employed. Sponging with gauze tends to force septic products into the loose tissues around the posterior peritoneum and promotes sepsis, whereas suction draws the septic products out.

4. The stump of the appendix is treated as simply as possible, merely ligating it, severing the appendix with the electric cautery, and cauterizing the stump with pure carbolic. The ends of the ligature on the stump of the appendix may be threaded in a needle and passed through adjacent peritoneum-covered fat to protect the stump from the drainage tube or to hasten the absorption of the stump, but no suture is placed in the cecum. H. E. Robertson, Chief Pathologist of the Mayo Clinic, said some time ago in a personal communication, ". . . for a long time I have been, in season and out of season, inveighing against the custom of burying the stump of the amputated appendix. It strikes me as wholly illogical and, worse than that, a dangerous procedure. The well-known ostrich with his head in the sand hasn't very much on this custom."

5. The cecum and colon are given physiologic rest. This cannot be accomplished by enemas or proctoclysis, which add a burden to the colon. The patient is supplied with water, the electrolytes and some calories by the continuous intravenous injection of 5 per cent dextrose in Ringer's solution.

In the market now are all glass containers which have this dextrose and Ringer's solution already mixed, and they are very satisfactory. Under no circumstances should the "drip" apparatus be used in the intravenous injection. It is difficult to understand why this was carried over from proctoclysis. The "drip" apparatus in intravenous injections is not only unnecessary, but it is dangerous, because when the patient strains as in vomiting the flow is blocked temporarily, and the air in the "drip" is compressed, while later the intravenous flow may be absorbed more rapidly and air sucked over from the "drip". The use of this drip apparatus probably explains the rather high incidence of pulmonary embolism that follows such continuous intravenous injections, of which there has been some complaint from other clinics.

We believe that it is the combination of these factors that gives a good result. Some of these procedures, as the McBurney incision, prompt operation and simple treatment of the stump of the appendix, we have employed for many years, but these combined with the use of suction instead of sponging and intravenous dextrose in Ringer's solution instead of proctoclysis we have practiced since 1930, and this combination as a whole seems to be more adequate than any one or more of these factors taken separately. Unless suction and intravenous dextrose in Ringer's solution are used, immediate operation in the presence of spreading peritonitis or the removal of the appendix in each case might be un-

wise, but with this combination it seems to be satisfactory.

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DISCUSSION

DR. A. S. BRINKLEY, Richmond: From the number of contributions to the literature on the subject of appendicitis within the last twenty-five years, it would seem that there would be very little left to be said about it. However, when one pauses to consider that the mortality rate, instead of decreasing, has increased within that period, I think Dr. Horsley's paper is most timely.

These unusual cases, with vague symptoms, described by Dr. Horsley in his paper, are the ones we have trouble with, especially the pelvic type and also when the appendix is up under the liver in the region of the gallbladder.

I have a patient in the hospital now—a girl fourteen years of age—who gave a history of pain low down in the right pelvic region of a little over twenty-four hours' duration; no nausea or vomiting, diarrhea, or constipation; no history of previous attacks. She was observed by her family physician at home in the country for twenty-four hours and when her condition showed no improvement she was sent to the hospital.

On admission, her temperature was 100, pulse 80, respiration 20, leucocytes 10,000, Polys 80, menstrual history normal. There was just a slight amount of tenderness on deep pressure over the right pelvic brim and a little muscle spasm in this area. She was prepared for immediate operation and a gangrenous appendix was found adherent to the under surface of the right broad ligament and much care had to be exercised to keep from rupturing it during removal.

There should not be any trouble about making a decision with a classical case of appendicitis but these unusual cases with vague symptoms will often give us much concern. They should be carefully considered and operated upon promptly, if reasonably sure of the diagnosis, to avoid rupture and its resulting consequences.

In reference to Dr. Horsley's statements as to the management of these cases, they coincide with mine, with a few exceptions. I still use the low gravity or flush method of proctoclysis. This consists of an ordinary irrigating can, a three-foot piece of rubber tubing, hard rubber douche nozzle, and a stop-cock for the tubing. The can should be placed at such a height as to insure an automatic outflow of gas from the colon to the can and an inflow of normal saline from the can to the colon.

I am convinced that these patients are made much more comfortable by using this method of protoclysis and I have had no reason to discontinue its use. I discarded the Murphy drip many years ago because it adds materially to the patient's discomfort. Dr. Horsley may have his reasons for not using any type of protoclysis.

In reference to treatment of the stump: I trained in a a hospital where they were much at odds in the treatment of the stump. During the two years of my training in this hospital, I had occasion to study these cases very carefully and my observation was that those cases on whom the simple treatment of the stump had been used did much better than the others.

During these two years we had two cases of fecal fistula to develop in perfectly clean cases where the so-called burying of the stump method was used. One was a sixteen-year-old girl who happened to be on my floor and I dressed her daily for about seven weeks; she recovered. The other was a man about thirty-five. They were somewhat late in opening him up and he died very promptly. Any unnecessarily complicated procedure in an operation always makes it worse for the patient and I can see no real excuse for burying the stump of the appendix.

I have used the simple ligature method of treatment of the stump for years and have never had any reason for changing. I discovered one day when I applied the clamp first, then ligated at the base, that there was a considerable amount of debris sprayed around on the sheets when the appendix was severed between; so now I ligate at the base first and strip out all the debris from the ligature back in the lumen toward the tip before severing between the ligature and forceps.

I enjoyed hearing Dr. Horsley's paper very much indeed.

DR. CARRINGTON WILLIAMS, Richmond: There are several points about Dr. Horsley's paper with which I do not agree, but I will discuss first several other points on which we are in complete accord.

The early diagnosis is of course the most important factor and this diagnosis is not always easy. Patients with acute appendicitis can have normal temperature; they can have normal leucocyte count; they can have absence of nausea and vomiting and I have seen one patient who had no abdominal pain. I agree with Dr. Horsley that the McBurney incision is the best one to make for acute appendicitis. I also agree with him that immediate operation should be done in all cases with one qualification, that there are certain abscesses which are better treated by a slight delay.

When one is presented with a group of statistics, it is important to analyze them in an effort to find out why these statistics are good or bad. I believe that there are two good reasons for the excellent record which Dr. Horsley has presented. The first is that these operations are skillfully done at St. Elizabeth's Hospital. The second reason is that the private hospitals in Richmond enjoy a situation which does not exist in any other part of the State. The best class of patients in our community and surrounding territory go to private hospitals, and these are the patients who are treated early. The lower classes who are notorious for their delay in seeking medical advice

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go to the general hospitals. I am sure that the other private hospitals in Richmond can duplicate the results which Dr. Horsley has presented. As a matter of fact Dr. Johns recently reported the experience of the Johnston-Willis Hospital at the Richmond Academy of Medicine and his mortality rate was a little lower than the one Dr. Horsley has reported.

In regard to intravenous fluids, I of course agree that the severe cases need it: the vast majority of them, however, will make a perfectly smooth convalescence without intravenous injections.

I do not think it makes any difference whether the stump of the appendix is tucked into the cecum or left out; the important thing is to do the operation skillfully. Personally, I think it is simpler and easier to tuck the stump through a purse string suture instead of going through the necessary effort to sterilize the stump and leave it out. I do not believe there are as many complications where the stump is tucked in, as there are if it is left out. Private hospitals in Richmond should be proud of their record for treating acute appendicitis but at the same time it should be remembered we have a preferred clientele.

DR. C. C. SMITH, Norfolk: Whenever I see an appendiceal stump ligated and dropped back I cannot but recall how much fuss was made in my interne days when the stump slipped out of the forcep before it was covered over. Soon after this I saw a surgeon of experience merely ligate the base, cut off the appendix and drop back the stump without treatment with cautery or chemicals and the patient did nicely. It has been my custom for a long time to use a purse string and tuck in the stump; recently I have reluctantly abandoned this and, because it is a little easier, I have been merely ligating and using carbolic on the stump. The patients seem to do just as well.

DR. R. DUVAL JONES, Norfolk: The subject has been pretty thoroughly covered. I wish to express my appreciation of Dr. Horsley's paper and to mention one or two points. I approve the McBurney incision. Secondly, there is a principle which Dr. Payne and I have employed since I have been with him, in treating cases where nature has built up some kind of a wall. We make no attempt to tie off the mesentery to the stump, but simply apply clamps and leave them for twenty-four to thirty-six hours. We feel that has been in a number of cases life-saving. One other point was the intravenous solutions in the treatment of peritonitis. It is a wonderful procedure, but particularly where it is hooked up with continuous gastric drainage we have to watch the blood chlorides, because with a continuous loss of gastric juices there will be a reduction of electrolytes.

DR. H. M. HAYTER, Abingdon: We do not have the advantages that those working in the larger centers do as so many of the cases which we see come from remote districts and have been sick for many days. When seen they show advanced peritonitis and are in no condition for immediate operation. These cases are treated, hoping to improve their condition. Many of these cases are lost, yet many improve, are operated upon and recover when at first the outlook seemed hopeless.

I cannot see that there has been any particular difference whether the stump of the appendix was inverted or covered over and dropped. My own preference is to invert the stump, first because I think it safer, and second, because of my early training.

DR. J. SHELTON HORSLEY, closing discussion: My two sons and I have gone over the published statistics of appendicitis, particularly the local published statistics, fairly thoroughly, and we have been unable to find statistics of treatment of all cases of appendicitis giving results as low as ours, that is, two-thirds of one per cent. It must be recalled that this represents every patient with appendicitis that we have seen professionally. We operate upon every case of acute appendicitis, no matter at what stage, whether there is peritonitis or not, just as soon as the diagnosis is made. Naturally, if one does not operate on the very ill cases, and calls them moribund and does not include them in the statistics, it will be possible to have a low mortality rate of operative cases of appendicitis by excluding those that are supposed to be moribund and are treated solely by the Ochsner method. However, a patient is just as dead if he dies of peritonitis without an operation as he is if he died following operation, and I think the only accurate method of obtaining statistics of the death rate of appendicitis is to count every patient the surgeon sees or treats, no matter by what means.

We have had five deaths in 768 consecutive cases. These deaths have been discussed in the paper, and the discussion need not be repeated here, but it might be well to call attention to the fact that no one of these deaths resulted from peritonitis solely from the appendix. In the two cases in which peritonitis caused death it was because the cases had been neglected and resection of the bowel in addition to the appendectomy had to be done.

Our patients are all operated upon by members of our staff, and not by interns or residents. This point which Dr. Carrington Williams has made is, I think, one of the elements of importance in reducing the mortality rate, though not the only element.

In regard to the technic of treating the stump of the appendix, this has been described in the body of the paper and the reasons for adopting the simple treatment have been elaborated there and elsewhere. As for Dr. Carrington Williams' advocacy of a method by which the appendix is cut off flush with the cecum and the wound sutured, it seems that this is a much more complicated technic. Nothing could be simpler and freer from sepsis than merely tying a string around the base of the appendix, cutting off the appendix with the cautery after protecting the cecum with moist gauze, and then disinfecting the stump. The appendix should not be clamped where it is to be tied because this produces a crushed band of tissue and the ligature brings together this crushed tissue with unnecessarily injured mucosa. When merely a ligature is tied around the base of the appendix, the only traumatized tissue is that within the grasp of the ligature. If, however, the technic suggested by Dr. Williams is followed and the appendix is severed with a knife flush with the cecum, the knife passes through septic material which

may be spread over the surface of the bowel. If a cautery is used, the cecum may be burned. It will be necessary to suture the mucosa of the cecum, which is of course septic, and the suture may smear sepsis around. Then, too, another row of sutures must be placed to bury the sutures in the mucosa.

The points about giving physiologic rest by administering intravenous dextrose in Ringer's solution and not using enemas have been discussed in the paper.

It seems to us that 768 consecutive cases of appendicitis with the five deaths that have been discussed is a sufficiently large series to lessen to some extent the element of luck. Many of these patients had spreading peritonitis, and in many of them there were appendicular abscesses. In no case have we failed to remove the appendix, whether an abscess existed or not, and thus we have apparently lowered the mortality rate and at the same time decreased the period of morbidity and eliminated the expense of a second operation with the attendant prolonged hospitalization.

SOME OBSERVATIONS ON MY EIGHT YEARS' EXPERIENCE IN A MODERN MENTAL HOSPITAL.*

A. D. HUTTON, M. D.,
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Solomon, in all his glory and buttressed by all his wisdom, could discern no new thing under the sun. But Solomon lived a thousand years before Christ! Had he lived in this twentieth century A. D., and particularly within the last few decades, he would never in this world have given utterance to such a thought. New things under the sun? Why they are as thick as autumnal leaves in Vallombrosa! In our profession their name is legion. How mighty and how wonderful have some of them been looking to the weal of the race. Just a bird's-eye view reveals such things as radium; X-ray; antiseptics; antitoxins; violet rays; development of vaccine therapy and serum therapy; electro-cardiography, and so forth, almost to an unlimited extent,—every one of them making a new rung on the ladder by which the human race seeks to climb to higher things.

And, let me add, these new things are not confined to discoveries and inventions of a curative nature only; they relate to methods as well. Do you realize that only a few years ago a hospital for the mentally sick was, abhorrent as it now seems to us, named and known as a *lunatic asylum,* and was so chartered by the legislatures of the States! Necessarily this very appellation had a depressing effect upon such patients as still possessed even a modicum of intelligence; such an effect as is indeed produced upon all of us when we hear of an institution for the unfortunate called Home for Incurables! Fortunately, due to the efforts of psychiatrists and social workers especially, the term *lunatic asylum* has been consigned to the limbo of the past. And thus came to pass one of the first changes in methods.

I have been on the medical staff of a State hospital for eight years and I have, necessarily, come into intimate contact with mental cases of all kinds. We have about 1,200 patients at the present time; almost equally divided between the sexes. And during this comparatively short time, what advancement has been made! Man's indefatigable efforts have resulted in making the patients more comfortable and more contented, and the goal of ultimate recovery in many classes is no longer a mere hopeless "will-o'-the-wisp." The old idea, that certainly at one time existed, of putting a patient away in order to control him and at the same time protect his family and the public, is a thing of the past. The modern hospital for the mentally ill is not willing to merely mark time; it is now an institution of research, of study, of action: it insists on results. And in order to achieve results, it is equipped with all the latest appliances, instruments and facilities utilizable in the task of mending the patient's body and healing his mind. A comparison of such modern hospital with the old lunatic asylum would shock you: you would indeed wonder why so many things were so long hid.

Of course you realize without any elaboration by me that infinite pains and tremendous detail are involved in properly organizing and carrying on the work of such an institution. Topsy may have "jest grow'd," but the only thing that just naturally grows about a hospital of the character described is the incessant stream of unfortunates that gravi-

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tates to its gates: all else is unremitting toil, eternal vigilance, and the exercise of certainly a fair amount of intelligence.

In order that everything may be done for the patient with promptness, exactitude and efficiency, the hospital has a medical and surgical department; a department of psychology; an X-ray department, diagnostic and treatment; clinical laboratory, well-equipped with all modern facilities, with well-trained technician in charge; dental department complete with X-ray; physio-therapy; occupational therapy, and recreation and social service departments.

Mental disorders, as of course everyone knows, come from a great variety of causes. There are the predisposing causes: heredity, birth-tramma, syphilis, both congenital and acquired, organic brain lesions, pellagra, brain tumors, circulatory disturbances; and then the exciting causes: alcohol, drugs, puerperal sepsis, certain infections, religious zeal and fervor, constitutional upsets, scholastic disappointments, marital incompatability, disappointments in love, *et cetera.*

When a patient enters a hospital for the mentally ill, he is, pursuant to an adopted policy, subjected to a complete physical examination. These are routine, namely: physical, neurological, dental, blood studies, including Wassermann, and urinalysis; and special investigations are made as indicated in order to determine what organic disease, if any, exists. We have for this the X-ray, including gastrointestinal series, stereoscopic cranial and chest plates; also of the spine, fluoroscopy, kidney function (dye test), renal fixation, basal metabolism, ophthalmoscopy, cystoscopy, *et cetera.*

After all essential data relating to the patient has been carefully compiled, mental studies are made, including tests to determine the degree of intelligence of the patient. In short, everything is done to ascertain the mental and physical picture of the patient, and then application of such knowledge in order to rescue the darkened mind from its plight is persistently pursued. Our high goal, of course, is to once more have a human being with a sound mind in a sound body.

Bear in mind that mental disorders do not, as a rule, come alone; there is scarcely a disease that we do not, at one time or another, have to combat. We have our gall-bladder cases; appendicitis; perforated ulcers; diabetes; nephritis; pelvic infections; influenza; heart diseases of every kind; luetic infections; pellagra, tuberculosis, and what not. And we even have obstetrical cases now and then upon the admission of new female patients. Of course there are many dislocations, fractures, and wounds; and we have our neurotics and our psychoses. In passing, I might remark that some patients react to all sorts and kinds of hallucinations and are possessed of all sorts of delusions. Some of them would be vastly amusing were they not so serious, so tragic. We recently admitted a patient to our criminal department—a general paretic, hopelessly insane—who has almost incredible delusions. He believes, in his darkened mind, that all types of fish, lizards, crocodiles, monkeys, snakes, and even elephants find their habitat in his abdomen!

I might also state that in excited cases we have, in large measure, abandoned the use of narcotics, such as morphine and hyoscine, and substituted in their stead physio-therapy among other things. Physio-therapy, for instance, brings about rest and relaxation; induces a more restful and refreshing sleep, thus assisting in bringing about a recovery. In doing away with narcotics as far as expedient, we do not of course subscribe literally to the dictum of Dr. Oliver Wendell Holmes. He once told the Harvard Medical School: "I firmly believe that if the whole materia medica could be sunk to the bottom of the sea, it would be all the better for mankind and all the worse for fishes."

Many, very many of the cases of insanity that come to us are caused by luetic infection. It is most gratifying to note the determined campaign that is now at last being made on that great American scourge, and it is particularly gratifying to note that the *corpus delicti,* as the lawyers would say, has been pitilessly dragged out into the open. For years syphilis has been a tabooed subject in the life of Americans; and for this prudery we have suffered much. There has been a progressive increase in the number of patients suffering with this loathsome and deadly disease, admitted to the hospital, where I am assistant physician. We have more patients right now victims of syphilis than at any other period in the history of the hospital. It is our aim to treat such cases for at least a year or more. We begin the treatment as soon as possible, giving from twenty-five to thirty injections of neoarsphenamine,

six to nine Gms. per dose, intravenously, alternating with courses of tryparsamide and different bismuth preparations. In the case of our elderly patients suffering from effects of central nervous syphilis we feel a hesitancy in giving any intravenous medication for fear of breaking down any resistance they might have established.

Results obtained by us are not as gratfying as we would like for the reason that most of the cases admitted give a history of syphilis of long-standing. Were these cases properly treated and the patient given proper advice at the inception of the infection, they could have been cured, but, unfortunately, too often this is not done. The picture presented to us week by week is sad and the situation not only is deplorable but intolerable. Here we have a young man, once fine-looking, of splendid heritage, college-bred, it may be; he develops an ulcer on the glans penis, or a sore on his lip or tongue. For obvious reasons, he doesn't go to the family physician, but calls on another in some other town or county. This physician examines the young man, but, sad to relate, too often does not make a dark-field examination or a serological examination. Instead he tells him there is nothing to worry about, and he gives him some sort of medicated salve, or he cauterizes the ulcer, and assures him that he will soon be all right. It is true that the ulcer apparently heals in a few days, and the young man goes on with his daily routine entirely unconscious of the fact that there is a smouldering volcano locked up in his system. He gets married, and, alas, perhaps becomes the father of children, and then, after a while, something happens. He doesn't feel right, has headaches, becomes irritable, develops mental fatigue, then ocular symptoms, the pupils becoming unequal and irregular and reacting sluggishly to light. Other focal symptoms develop—scanning of speech, disturbance in station and gait, and then, at last, the volcano erupts. He becomes violent, and has to be taken away from a once happy home to become an inmate of a mental institution. And how easy it could all have been avoided had the examining physician done his duty! How easy for him to have sent, at a cost of three cents in postage, a sample of the young man's blood to the State Board of Health! Let's all make this solemn pledge that from now on we will, one and all, conscientiously examine and advise all such cases, for only in that way will the scourge be diminished or curtailed.

So much has been said on this subject as to its origin, prevalence and treatment that I shall not presume to pursue the subject further. I have attempted to give you an insight of the pitiable spectacle that I see occurring day by day, and all because some one neglected to do his duty. Undoubtedly Robert E. Lee was right: Duty *is* the sublimest word in the English language!

Another disease of increasing importance as presented to us is pellagra. The investigation which we have made of this disease leads to the conclusion that pellagra is not a separate entity, that it is not a disease within itself. On the other hand, we prefer to think of so-called pellagra "as a disease of exhaustion," an "exhaustion syndrome." Our findings substantiate such a theory. Due to achlorhydria and grave anemia, all such patients suffer, not from lack of a balanced diet, but their malnutrition is due to the two factors specified. Their food cannot be assimilated if imperfectly digested, and cannot be distributed by reason of impoverished blood and low hemoglobin content.

This theory is substantiated by the fact that children and adults of the same family, receiving the same diet, may not develop pellagra. If it were actually a disease, the entire family would be affected. We have had excellent results in the treatment of our pellagra cases, with permanent recovery to a large extent.

In addition to a well-balanced diet and dilute hydrochloric acid, we give daily for one month 10 cc. .3 of 1.% solution of ferric and ammonium citrate intravenously.

I haven't the time, and I know you haven't the patience, for me to go into more detail concerning treatments at the Hospital. There is, however, one other subject that I wish to mention before closing.

In some minds the idea seems to have been conceived, and by many given credence, that the position of physician, surgeon, psychiatrist or psychologist at a State mental hospital is more or less a sinecure, generally filled by one who is lazy, incompetent or unprogressive, or else afraid of contacting the world in the matter of outside and general practice. Nothing is further from the truth, if you will believe one who is himself connected with such an institution. A lazy staff member? He wouldn't

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for a moment be tolerated. His would ultimately be the fate which every drone around a beehive meets sooner or later—only, instead of being killed, he would be exiled. But even a lazy man would shake off his sloth when he observes the need all the time of the patients committed to his care. Some men's work is from sun to sun, it is true, but at a hospital the work of the staff is never done!

Neither would an incompetent member be tolerated. As I have indicated, at one time or another practically every known disease has to be treated, and incompetency has no place in such a hospital. And if he is unprogressive, not abreast of the times, he does not belong.

Afraid of contacting the world? Any physician who can assist in the treatment daily of some 1,200 patients, men and women, with 1,200 distinct dispositions and 1,200 different idiosyncrasies; men and women from every walk of life, some of high and some of low degree, some law-abiding and some criminal; such a man, do you ask, afraid to go out into the world and earn his living? I leave the answer to you.

It might be asked, then, why choose such hard, exacting and unremunerative work when the outside world is so full of promise and so lavish in rewards? There are various answers. One might say that the work has a peculiar fascination, in addition to the desire to be of service to his fellow man—so badly treated by Fate. Another might say that he feels it his duty to stick to the less remunerative employment because he has trained and equipped himself as a specialist along that line and it would not be fair to quit; moreover, the world hates a quitter. Another, feeling that someone must do work of this nature, and having his heart in it, solemnly dedicates his life to help this more unfortunate and most helpless of all people.

Every physician in such employment realizes quite fully that big fees and great reputation are denied him, however able he might be. The State pays him enough to live on—no more, you may be sure; and he goes on his way serenely, disregardful of the temptations and opportunities of the outside world, imbued by a sense of duty, and determined to "carry on."

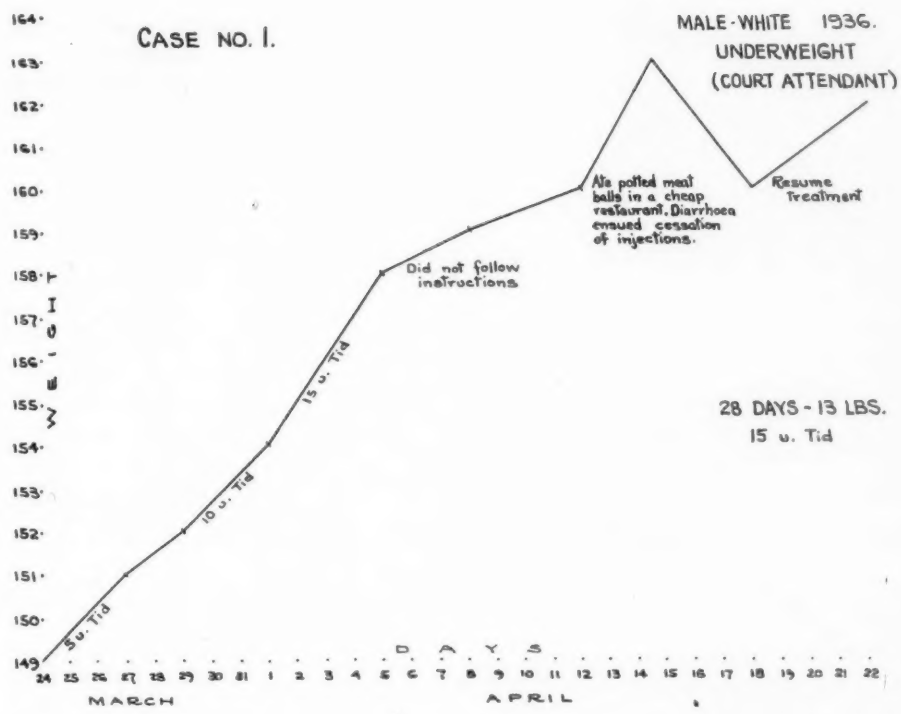
Someone has said that whoever could make two ears of corn, or two blades of grass to grow where one grew before, deserves the good will of all mankind. So we feel that in our humble service if we can restore one man and one woman to the bosom of his or her family, rehabilitated in mind and body, to once again lay the altar stones of a home, that sure foundation of all that is America and American, we have done a great thing—a thing that will give us pride in our work and ability to still further "carry on!"

A REPORT OF FIFTEEN UNDER-WEIGHT CASES TREATED WITH INSULIN AND DIETS.

J. TECUMSEH N. MCCASTOR, B. S., M. D.,
and
MARY COUSINS MCCASTOR, B. S., M. D.,
New York City

Since March 24, 1936, we have treated a number of under-weight patients with excellent results. We are reporting the first series of fifteen cases, consisting of men and women ranging between twenty and thirty years of age. Apparently, insulin plus high caloric diets combined with vitamins is a safe and certain method of helping patients to gain weight.

The question will arise, no doubt, as to whether the cost of this type of treatment is worth while. In these cases, the weight problem was most important, since all of the patients except two were applicants for Civil Service positions which had a minimum weight requirement. The trouble and cost of the treatment was negligible when one realizes that these patients were frustrated individuals, whose life efforts to win an appointment in desired occupations had been unsuccessful. The fate of their families as well as their own livelihood depended on "so many pounds of flesh", in as much as these patients had passed all of the necessary requirements except that of weight.



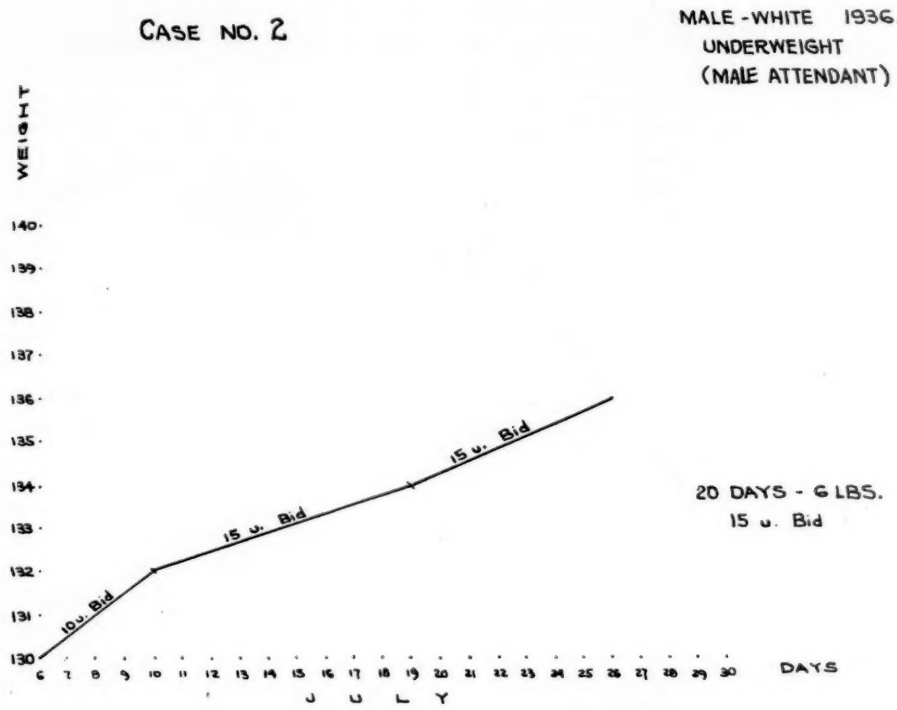
As previously stated, the patients were of both sexes, ranging from twenty to thirty years of age. The usual psychological concomitants of an unsatisfied, maladjusted individual were present. The typical patient in this group presented the picture of malnutrition—the long æsthenic type with visceroptosis and anemia. Gastrointestinal symptoms were most prevalent; nausea, constipation, flatulence, dizzy spells, lethargy, vague back and leg pains were listed by some of the group. Anorexia was also a common symptom, while others simply could not gain weight in spite of good appetites. All had tried various and sundry plans for weight gaining.

One female patient had been grievously constipated and had run the usual gamut of cathartics, this being one of the reasons for her first visit to our office. After one week of insulin and diet treatment she returned with an addition of six pounds, and happily reported that for the first time in her life she was not constipated.

Much emphasis was placed upon the importance of recognizing the environment-individual relationship. These patients were looking for a new hope—a renewed lease on life. Because of lack of a few pounds, they had been refused a life-long position, while unsuccessful attempts to gain weight had made hypochondriacal, skeptical and suspicious patients of them. At the outset, lack of cooperation with the doctor was often pronounced. It is here that the physician's personality and ability to establish *en rapport* with the patient is essential. These patients require much time and consideration.

During the first visit from our patient, we ascertained the exact number of pounds that he should weigh in order to meet the Civil Service requirement. After ruling out all contra-indications to insulin therapy, we proceeded to explain the exact procedure necessary for the patient to follow in order to acquire the required weight gain. Each was thoroughly instructed in the method of injecting and the care of the needle and syringe. He was explicitly informed of possible insulin shock and advised as to the procedure at the onset of symptoms suggesting hypoglycemia.

The initial dose of insulin was from five units to thirty units two or three times daily. Some who were employed found it impossible to take the mid-day injection. Each patient was given a diet sheet with instructions to keep a food diary. Additional vita-



mins were also given. The usual activities of the patients were in no way curtailed.

After three days, the patients were asked to return to us with a carefully written record of the medication and diets which they had taken. The purpose of this particular visit was to ascertain any changes, favorable or otherwise and to increase or diminish the insulin dosage according to indications. It also served to strengthen the personal contact between physician and patient.

Some members of this series continued throughout the treatment on fifteen units of insulin t.i.d. and attained the required weight, while others required larger doses. The maximum daily dosage was ninety (90) units.

The increase in weight varied from four (4) pounds in two (2) days to eighteen (18) pounds in twenty-two (22) days. All of the cases gained the number of pounds originally designated with the exception of two. These two were brothers, cases ten and eleven. They gained eleven (11) pounds in seventy-two (72) days, and fourteen and one-half (14½) pounds in one hundred and forty-four (144) days, respectively.

Striking changes were displayed in the patients in from three to five days after the initiation of treatment. The patient enters the office stating that he feels better, is more alive, more active and is not so easily fatigued. Objectively, the sunken cheek is fully rounded, the color is healthier, the eyes are more vivacious and a latent interest in his enviroment is awakened. The hypochondriac is no longer conscious of his "heart pain", backache, and fits of depression.

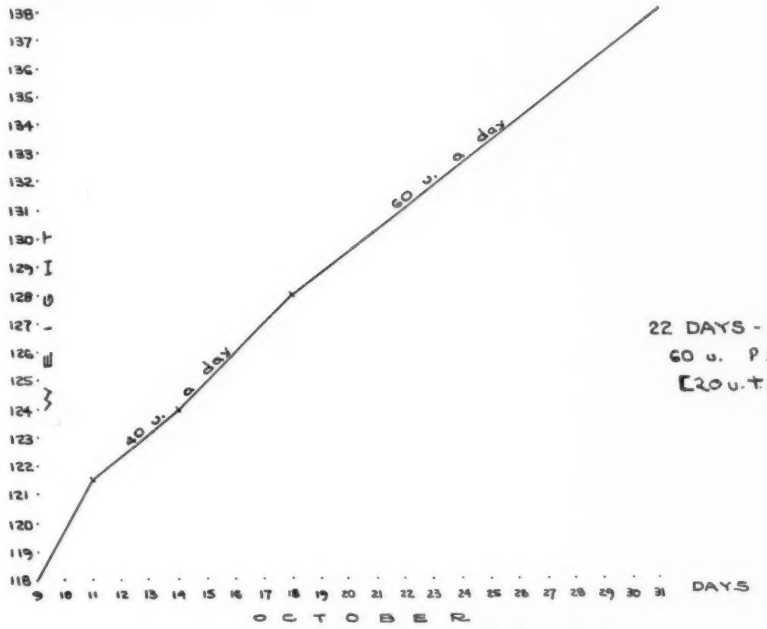
Reactions were both local and general. In four cases, about eleven o'clock in the morning the patients experienced subjective symptoms of nervousness and dizziness with a slight degree of nausea. This was soon eliminated by the taking of sugar at 10:00 A. M.

Local urticaria at site of injection was eradicated by changing the brand of insulin.

All but two of this series of patients were candidates for various Civil Service appointments in the city of New York. After the treatment, as outlined above, the required weights were attained and they were accepted by the commission and are now engaged in a gainful occupation.

CASE NO. 3

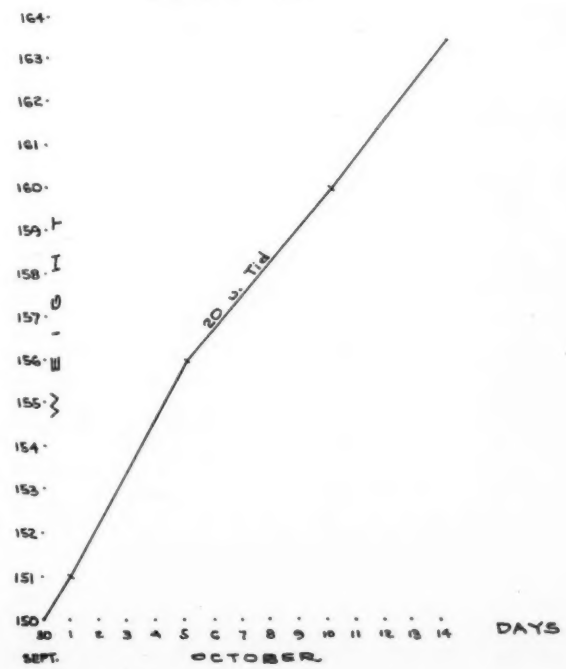
FEMALE - WHITE 21 YEARS
HEIGHT 5'-7½"



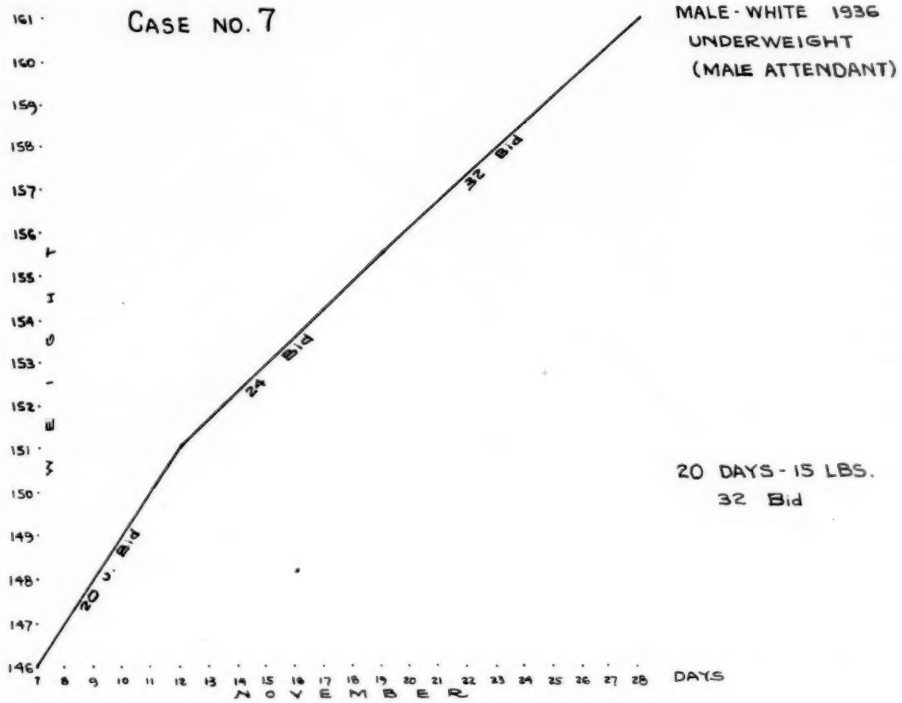
22 DAYS - 18 LBS.
60 u. P X day
[20 u. t.i.d.]

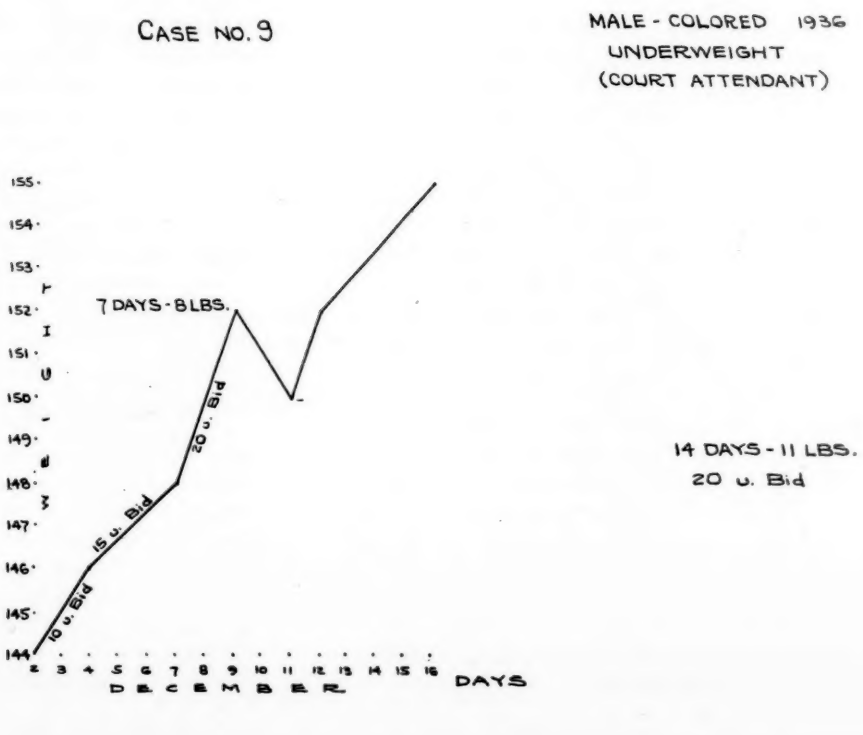
CASE NO. 4

MALE - WHITE 1936
UNDERWEIGHT



13 DAYS - 13½ LBS.
20 u. Tid


CASE NO. 7
MALE - WHITE 1936
UNDERWEIGHT
(MALE ATTENDANT)
20 u. Bid
24 Bid
32 Bid
20 DAYS - 15 LBS.
32 Bid
WEIGHT
DAYS
NOVEMBER


CASE NO. 9
MALE - COLORED 1936
UNDERWEIGHT
(COURT ATTENDANT)
7 DAYS - 8 LBS.
10 u. Bid
15 u. Bid
20 u. Bid
14 DAYS - 11 LBS.
20 u. Bid
WEIGHT
DAYS
DECEMBER

Case	*Days*	*Gain in Pounds*	*Units of Insulin*	*Total Daily Units of Insulin*
1	28	13	15 t.i.d.	45
2	20	6	15 t.i.d.	45
3	22	18	20 t.i.d.	60
4	13	13½	20 t.i.d.	60
5	12	3½	10 b.i.d.	20
6	6	9	30 once daily	30
7	20	15	32 b.i.d.	64
8	2	4	15 t.i.d.	45
9	14	11	20 b.i.d.	40
10	72	11	30 b.i.d.	60
11	144	14½	30 t.i.d.	90
12	29	14	20 t.i.d.	60
13	5	8	25 t.i.d.	75
14	89	12	20 t.i.d.	60
15	16	8	25 b.i.d.	50

Below is a summary of sixteen cases treated with insulin since date of the above report:

Patient	*No. of Days*	*Amount Gained*	*Remarks*
Is.	24 days	16½ lbs.	Met Requirements
Mu.	11 days	5 lbs.	Met Requirements
Vo.	1 mo.-3 days	12 lbs.	Met Requirements (and 1 mo. after stopping treatment, shows gain of 14 lbs.)
Ja.	1 mo.-8 days	12¼ lbs.	
He.	3 days	4 lbs.	Met Requirements
Cl.	4 days	4½ lbs.	½ lb. under—given 3 weeks extension.
Jo.	4 days	6 lbs.	1 lb. under—given extension, but has not returned for treatment.
Ro.	6 days	2 lbs.	Needs 4 more lbs., but has not returned for treatment since September 20, 1937.
McA.	15 days	16 lbs.	Needs 20 lbs. Still under treatment.
Da.	12 days	7 lbs.	Met requirements
Ma.	7 days	6 lbs.	Needs 20 lbs. Still under treatment.
Do.	3 days	4 lbs.	Needs 1 more lb.
Fre.	19 days	8 lbs.	Needs 7 lbs. more. Still under treatment.
Ch.	28 days	6 lbs.	Patient only followed instructions for first 7 days, but has resumed treatment.
Mo.	8 days	4 lbs.	
Ke.	11 days	8 lbs.	Needs 7 more lbs. Still under treatment.

Six charts are shown, which are representative of the group.

57 West 57th Street.

THE TREATMENT OF CONGESTIVE HEART FAILURE.*

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Time does not permit me to cover in detail all of the various aspects of the treatment of congestive heart failure. I shall, therefore, dwell very briefly on several points, and try to emphasize the various methods used to induce diuresis in patients with heart failure. When the heart is unable to maintain a satisfactory circulation, a condition of stasis or congestion develops. When this condition of stasis or congestion reaches the point where it causes symptoms or signs, the condition is called congestive failure. The cardinal symptom of congestive failure is dyspnea or shortness of breath. In the beginning a fair amount of exertion may bring on dyspnea; as the disease progresses dyspnea may be present without effort and, finally, the patient will have to sit nearly upright in order to get enough air. The congestion may show itself primarily at the base of the lungs, the right usually first. At times the congestion reveals itself first as pitting edema of the feet and ankles. The main congestion may occur first in the abdominal cavity, resulting in an enlarged liver and free abdominal fluid. If the condition progresses, we get the familiar picture of generalized dropsy.

In congestive heart failure, as in practically every type of disease, it is important to put the diseased organ as nearly as possible at complete physiological rest. The best way to approach this ideal in patients

*Read before the Southside Virginia Medical Association at Franklin, Va., March 9, 1937.

with heart failure is to put the patient to bed. He should be propped up with pillows if he experiences difficulty in breathing while flat. If the patient is still unable to breath comfortably when propped up, he may be allowed to sit in a chair by his bed. In severe failure absolute rest is indicated. By absolute rest we mean the following: the patient must not be allowed to move an arm or a leg, nor to go to the toilet; someone must feed the patient and move him about the bed as necessary. In less severe cases bed rest, but not absolute rest, is indicated. Such rest alone may improve the circulation so that a very good diuresis may occur.

A patient with a severe congestive failure often cannot sleep because of his uncomfortable condition or because of worry. Several nights of good sleep in such cases often result in remarkable improvement and may be life saving. Morphia is, in my opinion, the best drug to use in severe cases. If there is Cheyne-Stokes breathing, caffeine sodium benzoate, grains seven and one-half, given with the morphia will stimulate the respiratory center and offset the depressing effects of the morphine. Later mild sedatives such as bromides, the barbituric acid derivatives or chloral hydrate can replace the morphia.

The type of diet will vary in general according to the state of nutrition of the patient. If the patient is over-weight, a gradual reduction is advisable; if under-weight, a diet of high caloric value may be indicated. Recent work has tended to show that a very low caloric diet will lower the patient's metabolism and cause the heart to do less work; hence, such a diet may be of great value for a time in severe cases. More important than the type or quantity of foods is the quantity of fluids. This fact is often overlooked. A patient with dropsy should be limited to from 1,000 to 1,500 cc. (two to three pints) of fluid in twenty-four hours for a short period at least. Of course, if there is some contraindication to fluid limitation, the amount may be increased. The Karrel diet in which 200 cc. (a little less than one-half pint) of milk four times per day and absolutely nothing else is given will often start a marked diuresis. Of course such a limited diet can be given only a few days at a time.

Rest, sedatives and limitation of fluids will in many patients cause a diuresis accompanied by marked improvement. However, in some cases additional aid is needed, and we customarily turn to digitalis or its allied preparations. Even if rest and limitation of fluids seem to be working well, digitalis will often bring about additional and more rapid improvement. This is particularly true if auricular fibrillation is present, for, unless treated with digitalis, the patient with auricular fibrillation is apt to have a rapid and very irregular ventricular rate with a pulse deficit. As we all know, cases of auricular fibrillation with rapid ventricular rate, when properly treated with digitalis, usually present a dramatic improvement showing a slowing of the ventricular rate and a marked diuresis, resulting in a clearing up of the congestive failure. This slowing of the ventricular rate is brought about by an impairment of conduction through the auricular-ventricular bundle and represents the best understood action of digitalis. This, however, is not the only action of digitalis: it also increases the efficiency of the regular heart. According to Harrison, "This is brought about mainly by a decrease in the size of the ventricular cavities, but decrease in rate, elimination of pulse deficit and changes in the output in either direction may constitute subsidiary means whereby the efficiency of the heart is increased."

The three cardinal indications for digitalis therapy are: (1) auricular fibrillation with a rapid ventricular rate or auricular flutter; (2) definite symptoms or signs of congestive heart failure; (3) therapeutic testing in cases in which we are unable to be sure of the presence of congestive failure, or warding off an impending failure in patients who are becoming increasingly short of breath. The only common contraindication to the administration of digitalis in patients with congestive failure is digitalis intoxication. However, digitalis is useless in conditions of peripheral failure or shock such as may be found after surgical operations or in pneumonia or diphtheria. If congestive failure is present in these conditions, digitalis should of course be given. Digitalis acts as a diuretic only in an indirect manner through improving the state of the circulation of the whole body and particularly the kidneys.

Digitalis may in emergency cases be administered in massive and repeated doses. However, such methods are not ordinarily needed. The average patient will require about thirty grains of the standardized digitalis leaf for digitalization, and, if necessary, it is possible to administer this amount in twenty-four hours. If there is no urgency, it is my practice to give one one and one-half grain tablet

three times per day for one week, and then start the patient on the maintenance dose which may vary from one and one-half to three grains per day. The so-called maintenance dose is the approximate amount excreted daily by the patient. It is the consensus of opinion that if digitalis is to be used, the patient should be digitalized and then kept on a maintenance dose. Toxic symptoms must be watched for and each patient will have to be observed and treated according to his individual requirements. Unless there is some contraindication, I believe it is best to use digitalis in a tablet or pill form which is properly standardized. This method of administration is usually much more accurate than using the tincture.

If after a reasonable trial with rest, limitation of fluids and digitalis therapy, the symptoms of congestive failure persist, then the use of the more specific diuretics is indicated.

Among the most valuable of the specific diuretics are the purine group; caffeine itself is too weak a diuretic to be of much benefit. Theobromine is a stronger diuretic and does not cause as much cerebral excitation; it may be given in doses of five to seven grains three times per day for several days. The salts of theobromine are widely used as diuretics also. Theobromine sodium-salicylate, commonly known as diuretin, is a very useful diuretic because it is quite often effective and is usually very well tolerated. It can be given in doses of seven and one-half to fifteen grains three times per day for several days, or can be given in doses of twenty to twenty-five grains three times per day for two to three days. The larger doses may cause nausea if continued too long. Even if no nausea occurs it is better to give the drug for several days at a time at about ten-day intervals. Small doses, such as grains seven and one-half three times per day or twice per day, may be continued over rather prolonged periods. Theobromine-calcium salicylate (theocalcin) is quite similar to the sodium salts and its dosage is essentially the same. In the opinion of some cardiologists it is less nauseating and better suited to prolonged administration.

Cases which do not respond to the milder diuretics such as those mentioned above should be given one of the more vigorous diuretics of the purine group. Theophylline (or theocin) is perhaps the best of these. This view is also expressed by White, Harrison, Marvin, Barker, Levine and others. Theophylline is definitely a more powerful diuretic than theobromine or its sodium or calcium salts; however, it is also much more likely to cause nausea and vomiting. This drug may be given in doses of grains one and one-half to three, three times per day, for two to three days; however, if given longer, nausea is apt to occur. Hence, it is usually best to allow a rest interval of seven to ten days before repeating the treatment. In mild cases a daily dose of one and one-half grains may suffice to control edema. Theophylline-sodium-acetate (or theocin soluble) is, as its name suggests, soluble in water, and has been used for intravenous injection and also in suppositories. It is said to be less nauseating than theocin, and may be given in doses of two and one-half to five grains two to three times daily.

Other purine derivatives, which have some diuretic effect but seem to have a greater field as coronary dilators, are theophylline ethylene diamine, phyllicin, and theophylline-isoprapanalamine. Theophylline ethylene diamine, also known as metaphyllin, aminophyllin or euphyllin, is quite extensively used in diseases of the coronary arteries, particularly angina pectoris; in addition to its dilating effect on the coronaries, it is also a diuretic and may be given in doses of one and one-half to three grains three times per day. Theophylline calcium salicylate or phyllicin may be given in doses of four grains three to four times per day. Theophylline-isoprapanalamine may be given grains one and one-half three times per day. Glucophylline or theophylline-methyl glucamine has recently been advocated. It is claimed that the addition of methyl glucamine makes the theophylline more soluble, decreases the gastro-intestinal irritation and enhances its diuretic action. My experience with this new drug has been rather limited to date.

In a certain number of cases of congestive failure none of the above-mentioned remedies will produce the desired diuretic effect and it is necessary to resort to the even more powerful plain mercurial or combined mercurial diuretics. Mercury has long been known to be a powerful diuretic and has been used a great deal in the past, particularly in the form of mercurous chloride or calomel. Calomel may be given in doses of grains one to two, two to three times a day for two to three days. However, calomel may cause untoward effects such as stomatitis, colitis, diarrhea or even nephritis. Saxl and Heilig were the first to develop and use mercurial salts which could

be injected intravenously or intramuscularly. They reported their work in 1920; however, these drugs were not introduced into America until about 1929. Beginning a few years after this time numerous reports began to appear concerning these drugs and their value as diuretics. It is interesting to note that they were first used in the treatment of syphilis; however, their powerful diuretic action was soon noted and they filled a much needed place among diuretic drugs. Merbaphen or novasurol was the first of the new mercury compounds. Mersalyl or salyrgan came into use almost at the same time and is also a mercury compound, being a 10 per cent solution of mercury-salicyl-allylamidocetate of sodium containing 36 per cent of mercury. Salyrgan, although it contains a higher percentage of mercury than novasurol, is definitely less toxic and has to a great extent replaced novasurol. Occasionally salyrgan and more frequently novasurol have caused severe toxic effects such as colitis, nephritis and acute or subacute atrophy of the liver. Cadbury has recently reported a case of acute mercury poisoning following the intravenous injection of salyrgan. However, many thousands of injections of salyrgan have been given and only comparatively few have resulted in toxic effects. The most important point to note is the condition of the patient's kidneys. If there is an acute or subacute nephritis, the mercurial diuretics should not be given. The presence of albumin and a moderate number of casts is not a contra-indication to the administration of salyrgan; however, in a case showing definite hematuria, salyrgan should not be given. If a patient shows only a few red cells in the urine and if other diuretics fail, we may cautiously try one of the new mercury compounds. However, if signs or symptoms indicate a flare-up of the kidney condition, it is best to discontinue the drug.

Quite recently mercupurin has been introduced as a diuretic. Mercupurin is a combination of theophylline both free and chemically bound with a complex organic mercury compound. Mercupurin was introduced with the idea that the addition of the theophylline, which, as we remember, is one of the best of the purine diuretics, would cause a more marked diuretic action than the simple mercurial compound. A number of reports comparing the value of salyrgan and mercupurin have occurred in the literature and it is the consensus of opinion that their diuretic powers are about equal. Some workers favor mercupurin; however, it must have a longer trial before final conclusions are drawn.

The three above-mentioned drugs are all administered in the same manner and the preparations are such that the dosage is the same. They are given intravenously or intramuscularly, but never subcutaneously. It is of the greatest importance to remember that these drugs are extremely irritating, and that if a small amount leaks out of a vein into the skin, a great deal of pain and ugly ulcerations with sloughings may result. If there is any doubt as to whether or not the needle is properly in the vein, it is better not to try the intravenous route but to withdraw the needle and give it deep into the gluteal muscle. It has been my experience that mercupurin is less irritating to the subcutaneous tissues than is salyrgan, and I was glad to see some reports in the literature agreeing with me. The usual initial dose is one-half of one cc. given, as stated above, intravenously or intramuscularly. If no untoward effects are noted, the dose may be increased to one cc. then to two cc. I have given four cc. of mercupurin on a number of occasions and have noticed no untoward effects. This dose is not given, however, if two cc. will produce the desired results. The injections may be repeated once per week and if necessary twice per week; however, when given so often the urine must be frequently checked. Within the last few months preparations of salyrgan and mercurin which can be used in suppository form have been put on the market. With the mercurial diuretic we may expect an average output in twenty-four hours of about three to three and one-half quarts.

There are certain salts that have a mild diuretic action, acting usually by causing a mild acidosis. Such salts are calcium chloride, ammonium chloride, ammonium nitrate and ammonium sulphate. These salts are particularly useful in combination with the mercurial diuretics. In some cases the combination of the two will cause a marked diuresis after the mercurials have failed. Large doses of these salts are usually necessary and ammonium nitrate or chloride may be given in doses of twenty-two and one-half grains four times per day, or the calcium chloride twenty grains per day. In addition to producing an acidosis, these drugs seem to have a synergistic effect when used with the mercurials.

Urea in a single dose of two to three ounces has been used over long periods of time with good re-

sults by some. Parathyroid extract has also been tried as a diuretic.

The exact mechanism of action of the primary diuretics is not known. There does not seem any agreement as to whether the chief action is directly upon the kidneys or indirectly throughout the tissue fluids.

Finally, we may have to resort to mechanical means such as thoracic or abdominal paracentesis for the withdrawal of fluids. In some cases sterile incisions in the dorsum of the feet, or the use of Southey's tubes, small canulae which may be inserted into the legs or feet and attached to small rubber tubes for drainage, may drain off a great deal of the edematous fluids.

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Professional Building.

THE VALUE OF GASTROSCOPY.*

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Gastroscopy is a non-operative method of exploring the interior of the stomach. It is now past the critical experimental stages of its development and is accepted by every clinic in the world. Going hand in hand with X-ray, it affords the most valuable means at our disposal to diagnose gastric disease.

The medical profession is inclined to view new diagnostic procedures with either enthusiasm or skepticism, but, in the main, it is slow to accept any method of diagnosis or treatment until there has been creditable evidence of its merit. So it is with gastroscopy, which is new only in the sense that it has recently been perfected to a point where it is safe and practical. Yet, for many years, even antedating other valuable medical discoveries such as cystoscopy and radiology, pioneers have diligently worked on the problem of the non-surgical examination of the stomach.

The first man to vision the possibilities of gastroscopy was Kussmaul, who, in 1868, devised a metal tube which was to be passed into the stomach. His efforts were unsuccessful and his work in this direction was abandoned. From time to time interest was revived in gastroscopy and many contributions were made which eventually aided the perfection of the flexible gastroscope in 1932. To Dr. Rudolph

*Presented before the Peninsula Academy of Medicine, Hampton, Virginia, October 18, 1937.

Schindler we are indebted for this instrument of precision.

The gastroscope is composed of two essential parts, a distal flexible and a proximal rigid portion. The total length is 70½ cm. The distal end carries a soft rubber finger-tip, eight-volt electric lamp and an objective having a viewing angle of eighty degrees. In the flexible rubber portion are forty-six lenses covered with two thin layers of rubber. The proximal part is rigid and contains an ocular, light switch and air balloon. When one looks through the ocular, the view obtained is circular. Air is used to distend the collapsed stomach walls.

Since the introduction of the flexible gastroscope in 1932, our understanding of the gastric mucosa, either normal or pathological, has advanced with unbelievable rapidity. Today a direct view of the interior of the stomach is obtained. To have gained such world-wide recognition, the method of necessity, has had to be practical, safe and a valuable adjunct in diagnosis. I can attest to its practicability because we unhesitatingly gastroscope any patient in whom there is an indication of gastric disease and the diagnosis is in doubt.

The technique of introduction of the gastroscope further shows its practicability. The patient reports to the office without breakfast and is given a preliminary injection of codein and atropine. Forty-five minutes later the hypopharynx is sprayed with a two per cent solution of pontocaine. Using a soft Ewald stomach tube, the stomach is then emptied by gravity. With the patient in the left lateral position, the gastroscope is introduced as one would pass a stomach tube. A wide area of the interior of the stomach is then carefully observed. The patient experiences no discomfort, and the time consumed in making the examination depends upon the skill of the examiner. Special training in technique is desirable and, furthermore, essential to the appreciation of orientation and the interpretation of the mucosa under observation.

The clinical value of gastroscopy to the medical profession is now well established. Let us together explore the interior of the stomach. We must first reach the lower depths of the stomach, at which point we observe with amazing clearness the patulous opening of the antrum. Peristaltic waves are seen, and the normal mucosa will appear to have a glistening orange-red color. With slight withdrawal of the instrument we observe a rope-like anatomical structure called the musculus sphincter antri which, presumably, separates the antrum from the body of the stomach. If gastritis is present, we can then distinguish the various types as follows:

In atrophic gastritis the mucosa will appear to be thinned out and have patches of a grayish-green color. Prominent branching blood vessels will be seen, and occasionally true polyps are present. It has been observed in this type of gastritis, especially if associated with pernicious anemia, that the regeneration of the mucosa will follow adequate liver therapy. Also, the relationship between this type of gastritis and beginning carcinoma is believed to be very close.

If hypertrophic gastritis is the type under observation, then the mucous membrane is velvety and appears spongy. The mucosal folds are thickened and small nodules are frequently encountered. Hemorrhages from this condition are not infrequent.

If we should come upon superficial gastritis, then the characteristic signs would be a puffy redness of the mucosa, and a moist swollen appearance. Frequently the presence of thick tenacious pathological exudate is the only evidence of this condition.

If, by chance, we happen to be looking into a post-operative stomach in which a gastroenterostomy has been done, we will be thrilled by the appearance of the stoma. Here any pathological condition may exist and its extent determined. Sutures, ulcers, bleeding, gastritis or new growths are easily seen if present.

Continuing to sweep the mucosa with our objective might bring a true gastric ulcer into view. Here we would see a punched out crater, varying in size, the base being yellow in color, or the seat of an organized clot; and the edges of this depression would be sharply demarcated from the healthy surrounding tissue. In this connection, gastroscopic observations on true gastric ulcers lead us to believe that they are not prone to become malignant. Furthermore, much can be learned through gastroscopy of their tendency to bleed, chronicity, and their response to various types of therapy. This information, therefore, should have far-reaching value in our consideration of future management of these types of cases.

The question of tumor is the final consideration in this brief resumé of gastroscopy. Benign tumors, so frequently missed with the X-ray, are commonly seen gastroscopically. It has been observed that

they frequently either precede, accompany, or follow the appearance of atrophic gastritis. The appearance is very much like any benign type of tumor, yet they are of extreme importance. They are frequently the site of bleeding and not uncommonly become malignant, and, if pedunculated and located in the antrum, are apt to prolapse through the pylorus.

In this connection, I am reminded of a case which I recently saw through the courtesy of Dr. Karl Corley. The patient, a woman, age twenty-eight, had a rather large gastric hemorrhage. Several days later a report on the X-rays of the stomach stated that the bleeding was the result of a gastric polyp located in the antrum and prolapsing through the pylorus. Gastroscopy failed to reveal any pathology in the stomach and later examinations indicated that this patient was bleeding from a duodenal ulcer. This decisive information, as revealed by gastroscopy, was of great importance in determining the management of this patient's case. This case, together with others of equal interest, is to be published in greater detail at a future date.

Finally, a disease of the stomach causing great mortality of the human race has been faced by the gastroscope. We are all familiar with cancer of the stomach, its tendency to short history and rapid growth. As in neoplastic diseases of other organs, it is well recognized that early diagnosis determines to a large extent the hope for recovery. Direct vision with the gastroscope now affords a practical means of attacking this problem. It also means that X-ray and gastroscopy, as well as other laboratory methods at our disposal, must be correlated and used frequently whenever indicated. This further indicates that X-ray and gastroscopy are not competitive but supplementary.

In conclusion, it may be stated that many of our concepts of gastric disease must be revised and that the conventional diagnostic methods now employed must be supplemented by gastroscopy. This is based upon the following gastroscopic facts:

1. Gastritis, formerly a disease of questionable existence, has become a definite disease entity.
2. The site and cause of obscure bleeding from the stomach can be observed directly.
3. True gastric ulcer is not believed to become malignant.
4. The cause of persistent symptoms in postoperative stomach can more often be explained.
5. The earlier diagnosis of cancer of the stomach is possible.

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ATROPHIC CIRRHOSIS OF THE LIVER, WITH A CASE REPORT.*

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Stedman defines cirrhosis as a degeneration or atrophy of the parenchyma cells of an organ, with hypertrophy of the interstitial connective tissue.

First, may we consider briefly the physiology of the normal liver? This is the largest single organ of the human body, weighing about three to three and one-half pounds in the normal adult, or about one-fiftieth of the body weight. It occupies the superior and mainly right portion of the abdominal cavity, and lies immediately below the diaphragm.

In addition to its function of secreting bile, the liver plays an important part in the metabolism of both carbohydrate and nitrogenous materials ab-

*Read before the Northern Neck Medical Society.

sorbed from the intestines and which are conveyed to it by the portal vein. It is also thought to have something to do with the desaturation of fatty acids. It also has a number of other indispensable functions, serving as a "graveyard" for the red corpuscles, and is one of the most important sites for the storage of iron pigment obtained from them in destruction. It is also a site of manufacture of fibrogen, and it may be the sole place of creation of this material. There is clinical and laboratory evidence to support the theory that this organ has something to do with the formation of antithrombin.

For practical purposes, it is convenient to divide cirrhosis of the liver into two main classes, portal and biliary. The term "cirrhosis," which was first applied by Laennec, refers to that tawny color of the liver in the commoner type, portal, but it has since, by common usage, become synonymous with fibrosis. The term portal cirrhosis, or Laennec's cirrhosis, atrophic cirrhosis, alcoholic cirrhosis, hobnail liver, or gin-drinker's liver are all synonymous terms.

Portal cirrhosis is, as a rule, a disease of middle age. It may, however, occasionally develop in young children. The condition usually appears in individuals about forty years of age and terminates fatally in the early fifties. Men are affected more often than women, two to one; occupation and station in life seem to have no influence other than of possibly exposing the individual to alcoholism.

In spite of attempts, especially in recent years, to explain portal cirrhosis on the basis of infection, or "subinfection" and intoxications other than with alcohol, very strong clinical opinion still points to alcohol as the chief etiological factor. The poison may act directly on the liver cells after absorption into the portal system from the gastro-intestinal tract, or indirectly by injuring the gastro-intestinal mucosa and producing a catarrhal condition which leads to chronic portal infection or intoxication. Whatever the mode of action, it is certain that the disease is very common in men who drink distilled liquors steadily and in excess.

The ingestion of highly seasoned foods is also believed to be a contributory factor in some cases, particularly among Mohammedans and Chinese who do not use alcohol.

While the liver is usually smaller than normal, because of the contraction of the fibrous tissue and atrophy of the liver cells, it is often enlarged, especially when there is much fatty change. There may be also, as the disease progresses, a very considerable restoration of the liver substance by compensatory hyperplasia. Acute infectious diseases, syphilis, tuberculosis, and malaria have also been regarded as additional inciting factors. In all probability there is necessarily a combination of toxic agents to produce the lesion. In the ordinary type the surface is granular, with elevations or "hob nails" which vary from the size of a pin head to that of a pea. The cut surface, which is usually yellowish in color, displaces a network of fine and coarse pearly bodies of connective tissue.

Some of the most important symptoms are obstruction of the portal circulation, which causes congestion and catarrh of the stomach; hence the initial symptoms are anorexia, fetor of breath, fulness and distress after eating, eructation, nausea and vomiting of mucus in advanced cases, flatulence and constipation. For months and years these phenomena may be the only evidence of the disease.

As the pressure in the portal system increases, the collateral vessels engorge, and as a result the superficial abdominal veins become prominent and hemorrhoids develop. Engorgement of the portal also leads to ascites and swelling of the feet, to enlargement of the spleen, and not infrequently to conspicuous hemorrhage from the stomach or bowels. There is a gradual loss of flesh and strength, the skin is muddy in appearance, though conspicuous jaundice is not common and occurs only as a complication. Nervous symptoms, delirium, stupor, convulsions and coma occasionally appear toward the end of the disease. They are probably due to the retention of poisons that the liver is unable to convert or eliminate.

The majority of cases terminate fatally in from three to five years, or from one to two years after the compensatory circulation fails. Death results from exhaustion, hemorrhage, pulmonary edema, or toxemia. About 25 per cent of cases vomit blood; of these about one-fifth die of hemorrhage, generally from the esophageal veins or gastric oozing from the mucosa.

The kidneys, heart and blood vessels are often coincidentally involved in the cirrhotic process. Tuberculosis of the peritoneum is a common complication. Ascites develops in about 50 per cent of cases, and in the great majority of those who die of the disease is a prominent feature. It is said to be due

not only to portal obstruction, but in certain cases to chronic peritonitis, to toxemia, or to cardiac failure. The abdomen may be enormously enlarged and distended and contain as much as fifteen to twenty liters of fluid. Although toxic symptoms usually develop during the later stage of the disease, they may appear at any time.

In the early stage the diagnosis can only be suspected. In the drunkard, chronic gastric catarrh with enlargement of the liver would strongly indicate the disease. Thrombosis of the portal vein produces a similar clinical picture, but the symptoms usually develop much more rapidly.

During the early stage of portal cirrhosis the symptoms are so vague that definite diagnosis is often very difficult. In alcoholic patients or an individual who has led an irregular life, persistent dyspepsia with repeated attacks of "biliousness" and perhaps slight jaundice should arouse suspicion of an early hepatic cirrhosis. Added confirmation is given if the liver be enlarged and tender and the spleen enlarged. Later the "hepatic face" is characteristic; the patient is thin, the eyes sunken, the nose sharp, distinct venules appear on the nose and cheeks, and the skin is muddy or subicteroid. Definite signs of portal obstruction render the diagnosis certain.

Any degree of accuracy in prognosis is almost impossible on account of the wide variations in the causes of the disease. At times when there are no major symptoms, the disease may remain unrecognized throughout life and the victim die from some other cause. Again, the disease may be acute and end fatally in a few months. The great bulk of cases fall between those extremes, and the average duration form the onset of definite evidence of cirrhosis until death is about ten years. Death is usually due to toxemia, inanition, or intercurrent infection.

The treatment of the disease is almost as indefinite as the prognosis; however, in the pre-ascitic stage and before hematemesis has occurred, the therapeutic measures should rectify the patient's mode of life and personal hygiene. Alcohol should be prohibited, large quantities of water taken, and the bowels regulated with salines. The diet should be simple, and free from highly-seasoned foods. Milk, if well-tolerated, should be used freely, but eggs, meats and fats should be restricted. Suitable exercise and hydrotherapy are necessary.

CASE REPORT

Patient, a white male, age sixty-four, married. American, canning factory manager.

This patient was admitted to St. Luke's Hospital, Richmond, Va., in 1930, under the services of Dr. J. H. Smith and Dr. W. W. Gill, the latter on account of some ear trouble which turned out to be a benign osteoma of the right auditory canal, which was removed and from which the patient had no further trouble. However, at this time there was question about cardiac irregularity associated with epigastric fullness and distress, especially just after a hearty meal. Blood pressure was rather high, but circulation as a whole was thought to be in very good condition.

On January 24, 1936, the patient was in a boat to get some oysters and fell between boat and wharf, injuring chin, nose, right arm, tongue and lips. Nose bled considerably for several weeks, for which he was referred to Dr. Wallace Gill, who found there was some abrasion of the right middle turbinate; also the septal membrane was torn on both sides. This, however, soon cleared up, and the patient seemed to get along very nicely from his accident.

About the middle of February he noticed considerable swelling of his feet and ankles, being more noticeable at night, and seemed worse when he was up and around very much. Later he began to have some shortness of breath, the least exhertion making him quite breathless. Around the first of March he noticed his abdomen increasing in size; however, there was no particular nocturnal dyspnea or orthopnea. Since that time dyspnea, swelling of feet and ankles, and enlargement of abdomen got worse and became more constant. During the middle of March his whole abdomen seemed sore and there was a dull aching pain in lateral abdomen at times, while at other times it was in the epigastrium. He complained of small amounts of food filling him up.

However, as previously stated, his sensation of heart skipping gave him but little concern. The usual weight of this patient was 165; present weight 180. No urinary symptoms, bowels act moderately well, slight cough for some months with mucoid sputum. No hemoptysis. He took mild laxatives occasionally, but has never taken any digitalis for the heart action.

General appearance is that of a well-developed and nourished elderly white man lying flat in bed,

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apparently in no particular pain or distress. Pupils equal and regular; reacted to light and accommodation. Eyegrounds showed considerable evidence of arteriosclerosis, disc was clear; nose and ears roughly normal other than the patient seemed rather deaf; mouth and throat essentially negative.

Neck vessels showed some engorgement and there was moderate pulsation on right side; thyroid gland normal. Apex of heart rather indistinctly made out in fifth interspace about three cm. lateral to the midclavicular line; rhythm regular; rate eighty-six. There was a short rough systolic murmur around the apex, and a similar murmur in the pulmonic area. Blood pressure 140/80. Aortic second sound rather distant and about equal to pulmonic second sound. There was some dullness at the base of both lungs, particularly on the right.

The abdomen was markedly distended and tense, with a definite fluid wave. There was an indefinite rounded, hard, firm, possibly slightly tender mass in the epigastrium, where there was some dullness, which extended to the right, suggesting that the whole abnormality here was an enlarged liver. Spleen and kidneys not felt. No other abnormality found in the abdominal cavity.

The extremities showed no tremor or clubbing; epitrochlear glands not palpable. There was well-marked pitting edema over both tibiae, being more pronounced over the right, and extending to some distance above the knees. Knee and ankle reflexes not obtainable on account of the edema.

The condition of this patient continued to become progressively worse until the last of March, when he was sent to St. Luke's Hospital under the care of Dr. J. H. Smith, with practically the same physical findings as previously stated. Laboratory findings at this time were as follows:

Hemoglobin 60 per cent; color index .9; R. B. C. 3,250,000; leukocytes 3,600; polys, 75 per cent; lymphs, 23 per cent; eosinophils, 2 per cent. Urinalysis: Color, dark amber, slightly cloudy; acid reaction, sp. gr. 1,029; slight trace of albumin, sugar and acetone negative, bile negative. Microscopally: No blood, one to two pus cells per high-power field, mucus abundant, occasional hyalin and granular casts. Renal function (phthalein test): Excretion first hour, 55 per cent; excretion, second hour, 10 per cent; total in two hours, 65 per cent. Blood chemistry showed 100 mg. of sugar per 100 cc. of blood. Blood Wassermann negative.

This patient returned home from St. Luke's Hospital April 11, 1936, with some improvement of the edema of the extremities; however, his abdominal distention had improved but little if any. He was continued on fifteen grains of ammonium chloride three times a day, and one and one-half grains of digitalis daily, with intravenous salyrgan three times a week in one cc. doses. This was later substituted by novasurol, but with no avail.

His ascites grew from bad to worse until it was deemed advisable to remove the ascitic fluid by paracentesis. Ten quarts was removed about the first of May, and this gave considerable relief for a few days, only to be repeated about every ten days to take care of the respiratory embarrassment and abdominal discomfort. This was repeated five times from May 1 until June 15, removing a total of twenty-eight quarts of fluid.

During the last six weeks before death the patient would become very toxic and comatosed, lasting from twenty-four to forty-eight hours, after which he would be reasonably rational and bright. At times codeine was resorted to to take care of pain; however, at no time did he suffer great pain.

A few weeks prior to death the superficial abdominal veins and especially those on the right side became very prominent and rather engorged; also rather bad hemorrhoids developed, and these frequently bled. Patient died July 24 from general toxemia and exhaustion.

May we state here that this patient had been a rather heavy and constant user of strong alcoholic beverages practically all of his life.

Autopsy was confined to the abdominal cavity, which revealed a rather small, hard, fibrous and nodular liver about one-half the normal size, with considerable hardening and fibrous tissue formation about the hepatic vessels and gall-bladder. The pancreas was smaller than normal in size with no particular gross pathology. The spleen was about three times the normal size, and was distinctly hard and fibrous. The stomach and small intestines showed no gross pathological lesions.

Microscopic sections of the spleen and liver were diagnosed by Dr. S. W. Budd as: Interlobular cirrhosis, and splenomegaly or Banti's disease.

A CASE OF ACUTE STAPHYLOCOCCIC OSTEOMYELITIS AND STAPHYLOCOCCEMIA TREATED WITH STAPHYLOCOCCUS ANTITOXIN AND PROMPT SURGICAL DRAINAGE.

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As early as 1894 the toxicity of staphylococcal filtrates was described[1] as causing degenerative changes in the leucocytes of the rabbit. Soon thereafter other observers[2] demonstrated that rabbits developed specific anti-leucocidic properties in their blood serum after a series of increasing subcutaneous injections of staphylococcus filtrates.

In 1927, Parker and Banzhof[3], were successful in producing a serum by injecting horses with staphylococcus filtrates which in high dilutions neutralized the skin-necrotizing properties of staphylococcus filtrates.

Very little recognition was given these early observations until 1928 when a disaster occurred in Bundaberg, Australia, which resulted in the death within fifteen to thirty-four hours of twelve children out of twenty-one injected with diphtheria toxin-antitoxin mixture. The diphtheria toxin-antitoxin mixture was subsequently proven to have been contaminated with staphylococci. The report of the Royal Commission of Investigation[4] concluded that the fatalities were due to the injection of living toxigenic staphylococci.

Subsequent to the Bundaberg disaster and the resulting revival of interest initiated by Burnet[5] in the toxigenic properties of staphylococci, various workers including Burnet[6] have reported the preparation of staphylococcus antitoxin serum from horses immunized with staphylococcus exotoxin. Encouraging clinical results have been observed with staphylococcus antitoxin in the treatment of staphylococcus infections by Panton, Balentine and Dix[7], Gross,[8-9-10] Parish and Clark,[11] Dolman,[12-13] Keith,[14] and Joyner and Smith.[15] The largest and best controlled series of cases was reported by Dolman. Joyner and Smith observed that the total leucocyte count and the ratio of segmented to non-segmented polymorphonuclear leucocytes was a reliable index of the severity of toxemia and a convenient guide to the dose and frequency of administration of the antitoxin.

It is of interest to point out that in Dolman's series of cases with osteomyelitis and staphylococcemia he found there was no relationship between the site of the infection and severity of the toxemia except when the site was in the neighborhood of the hip joint. He states that osteomyelitis in this region is not often diagnosed early and that, when diagnosed, satisfactory drainage provides a difficult surgical problem. He feels that infections which localize in this region lead toward a fulminating type with profound toxemia.[13]

We believe the following case presents an excellent result in the treatment of acute osteomyelitis in the region of the hip combining early surgical drainage with the use of staphylococcus antitoxin. The differential leukocytic formula and the total leucocyte count combined with the clinical signs of toxemia were used as criteria for the administration of the antitoxin.

CASE REPORT

Case No. 82346.—O. P. T., a white female, fifteen years of age, was submitted to Duke University Hospital March 3, 1937, with the complaint of four days' duration, of severe throbbing pain in the region of the right groin and perineum. She gave a history of having had, two weeks previously, a vesicle on her right heel which drained some yellowish material for a few days and then healed completely. There is also a history of trauma, when, twelve days prior to admission, she had attempted to do the "splits" and felt something pop in the region of her right hip with associated pain in the right groin. She apparently recovered from all this and was getting along nicely until, four days prior to admission, she developed severe pain in the right groin with a feeling of malaise and some fever. This continued until the pain became excruciating

and was accentuated by any movement of the right leg or rotation of the body. Her family physician who had been keeping her in bed with moist heat to the region observed her toxicity and referred her into the hospital.

On admission to the hospital the patient was acutely ill and in obvious distress: T. 39.4, P. 96, R. 24. Positive findings on physical examination were limited to the right hip region. There was definite fulness, swelling, local heat and tenderness about the right hip region with pronounced, almost finger point tenderness over the posterior aspect of the greater trochanter. There was a suggestive fulness of the joint capsule to palpation. All motion of the right hip was markedly guarded, and the thigh was held in a flexed and abducted position. The patient's pallor, anxiety, and general picture was that of sepsis. Accessory findings at this time showed a hemoglobin of 84 per cent and a leucocytosis of 22,200 (62 per cent segmented, 20 per cent J-forms, 8 per cent stab-forms, and 10 per cent lymphocytes), negative blood Wassermann and urinary findings. Blood culture revealed eighteen colonies of hemolytic staphylococcus aureus per cc. of blood. A diagnostic aspiration of the hip joint confirmed a joint effusion but the synovial fluid was grossly negative and sterile on culture. X-rays of the right hip and pelvis were reported normal.

The clinical impression was that of an acute osteomyelitis of the upper end of the femur without extension into the hip joint, so that the next day a posterior approach to the hip joint (Ober's) was made. A somewhat distended and injected capsule was demonstrated from which pus was aspirated; the decision was made not to trephine the bone and drainage was established by capsulotomy and a penrose drain. Hip spica was then applied. Culture of the joint was now positive for hemolytic staphylococcus aureus.

The patient continued to appear very toxic and spiked a daily fever above 39° and on the third post-operative day revealed sixty colonies per cc. of blood on culture. She had previously received two transfusions of 250 cc. of citrated blood. Her total leukocyte count which has risen to 22,000 was now 14,000 with marked increase in non-segmented polymorphonuclear leucocytes and a fall in segmented polymorphonuclear, with a ratio of 1:1. Staphylococcus antitoxin was felt to be indicated and the patient was given 20,000 international units intramuscularly. On the following day the patient complained of chest pain, had a respiratory rate of forty per minute and a cough, productive of large amounts of thick muco-purulent sputum, cultures of which were positive for hemolytic staphylococcus aureus. Portable X-rays confirmed a broncho-pneumonia in the lower lobe of the left lung. The patient was given 60,000 units of antitoxin and several hours after this treatment her temperature had fallen and her leucocyte count rose to 15,800 with a slight increase in segmented polymorphonuclear leucocytes over the non-segmented forms.

During the next two days she received 20,000 units of antitoxin intramuscularly. Her respiratory complaints disappeared and X-ray examination showed a clear chest on her ninth hospital day. Her leucocyte count on this day was 28,700 with a marked increase in segmented polymorphonuclear leucocytes and a decrease in non-segmented forms. On the tenth hospital day the right inguinal region showed definite fulness and was aspirated after removing the plaster spica and traction applied; definite pus was demonstrated and incision and drainage under gas showed the abscess to lie just anterior to the hip joint. By the thirteenth day the patient's leucocyte count had fallen to 15,000 with a decrease in segmented polymorphonuclear in relation to non-segmented polymorphonuclear forms. It was again thought advisable to administer more antitoxin and she received 20,000 units intramuscularly. The following day she complained of severe pain in the right elbow; the joint was slightly swollen, red, hot, and quite painful on motion. The joint was aspirated and about 6 cc. of purulent fluid withdrawn from which was grown a pure culture of hemolytic staphylococcus aureus; with rest and local heat the pain and inflammation subsided. Subsequent X-ray examination showed no bony involvement and full range of motion of the elbow joint. On the seventeenth hospital day the patient was started on a course of staphylococcus toxoid treatments, after a skin test of 0.1 cc. of 1:10 dilution gave no reaction. A total of fourteen subcutaneous injections of toxoid in increasing amounts and strength was given every other day, finally ending, with patient's dismissal, with 0.6 cc. of 1:1 (concentrated) dilution (see chart). The patient gradually improved during the rest of her hospital stay.

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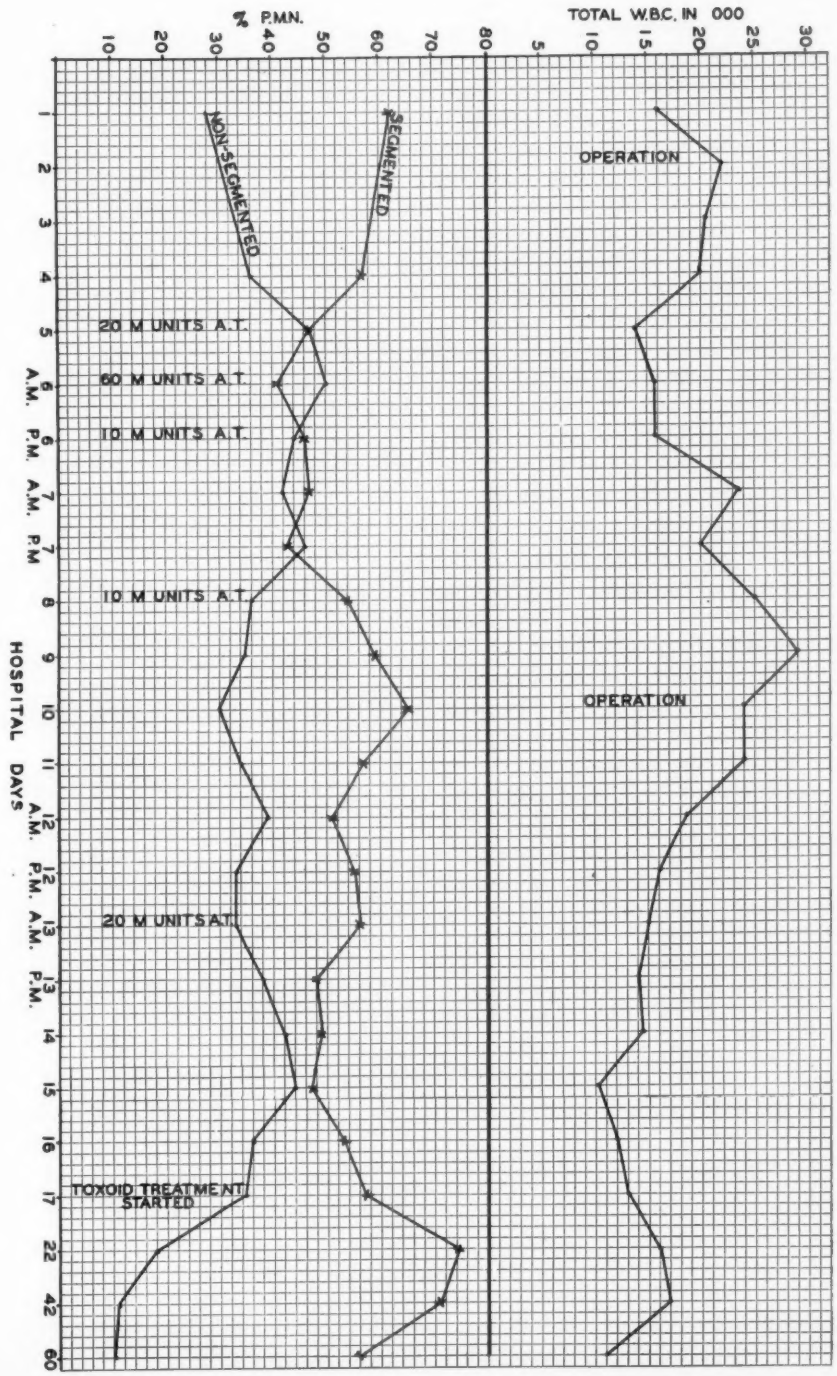
% P.M.N.
10 20 30 40 50 60 70 80
TOTAL W.B.C. IN 000
5 10 15 20 25 30
NON-SEGMENTED
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OPERATION
20 M UNITS A.T.
60 M UNITS A.T.
10 M UNITS A.T.
10 M UNITS A.T.
OPERATION
20 M UNITS A.T.
TOXOID TREATMENT STARTED
HOSPITAL DAYS
1 2 3 4 5 6 A.M. 6 P.M. A.M. 7 P.M. 8 9 10 11 12 A.M. 12 P.M. A.M. 13 P.M. 14 15 16 17 22 42 60

Chart showing relationship of total leucocyte count and segment to non-segment forms as indication for administration of hemolytic staphylococcus aureus antitoxin.

X-rays of the right hip and pelvis later revealed extensive osteomyelitic destruction of the entire innominate bone, extending into the head and neck of the right femur. From the nineteenth to the sixty-sixth hospital day blood cultures were repeatedly sterile with one exception when less than one colony per cc. was grown. During her hospital stay she received a total of twenty blood transfusions of 250 cc. each (one about every third day). Her general condition gradually improved so that during the last twelve days of her stay her temperature was normal except for one brief elevation of 38.2°, and the discharge from the two wounds had almost entirely ceased.

The patient was placed in a hip spica and discharged on the sixty-sixth hospital day with instructions to continue nursing care at home and return to the hospital in two months for check-up.

CONCLUSION

A case of acute hemolytic staphylococcic aureus pyemia with secondary acute osteomyelitis of the pelvis, suppurative arthritis of an elbow, and bronchial pneumonia is presented to demonstrate the value of a specific antitoxin used in conjunction with the usual treatment of surgical drainage, splinting, and transfusions. The administration and dosage of the antitoxin is based on the degree of toxemia as determined by clinical signs and leucocyte reaction (total leucocyte count and ratio of segmented to non-segmented polymorphonuclear leucocytes). A further tissue response was stimulated in the chronic stage by administration of a specific toxoid.

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AIR EMBOLISM OR PLEURAL SHOCK—REPORT OF TWO CASES.

G. S. HARTLEY, M. D.,
Chief of Medicine,
and
F. H. YORKOFF, M. D.,
Resident in Medicine, C. and O. Hospital,
Clifton Forge, Virginia

It has oft been said by chest men that if thoracentesis and artificial pneumothorax are employed long enough, one is apt to encounter untoward symptoms and sudden death. Pleural shock, so called, was originally described in 1864 by Roger. He described it as an "eclamptic fit" characterized by cardio-respiratory embarrassment, tonic and clonic contraction of the muscles, loss of consciousness and in some in-

stances sudden death. Roger ascribed this symptom complex to reflex nervous disturbances. Brauer in 1912 put forth the view that it was in reality due to air embolism. In 1911 Dayton reported fifteen fatal cases following thoracentesis. Since the introduction of artificial pneumothorax as a therapeutic measure, these accidents have been noted with great frequency. Whether the cause be pleural shock, air embolism, or other factors as pulmonary edema or thrombosis, the essential thing to remember is that they do happen.

Within the past five weeks we have had two cases, in which one terminated fatally. The most recent case is believed to be one of air embolism. This patient is now living and is apparently suffering no residual effects.

Case No. 1. Mrs. L. M., a white woman, forty-nine years of age, who came to the Out-Patient Department for stereoscopic examination of her chest on Thursday, October 21, 1937, had formerly received artificial pneumothorax for pulmonary tuberculosis of her left upper chest.

Family History: Mother had died of penumonia about ten years ago. Father had died of old age. There were no brothers or sisters, no history of vascular disease, no diabetes or tuberculosis in her family.

Past History: Unessential.

Marital: Patient has been happily married for twenty-five years. Her husband has an arrested case of pulmonary tuberculosis of the left side, the duration of which is unknown. Her eldest boy who is twenty-five years old has had tuberculosis since 1932. He had previously been in a sanatorium and is not clinically free from symptoms. He has now been without gas for almost a year. Her other child, a young man of twenty years, has been to this Hospital frequently for "gas" because of active tuberculosis. Probably three years ago the patient presented clinical symptoms of pulmonary tuberculosis, but it is only during the last year that she has been receiving treatment, such as institutionalization for a period of several months and artificial pneumothorax of her left upper chest.

Present Story: Upon stereoscopic examination it was decided that the patient needed artificial pneumothorax of her left upper chest because of some activity. The patient was placed on her right side and air was introduced into the fourth interspace posteriorally on the left. About 100 c.c. was introduced when it was noticed that the patient had become cyanotic and was having a difficult time breathing. The needle was immediately withdrawn and at that time the patient lapsed into unconsciousness. She was immediately placed in the Trendelenburg position and given artificial respiration. Oxygen was started as quickly as possible, and one c.c. adrenalin was given intravenously. Her color became better. Her pulse picked up and her respirations had more depth to them. Upon reacting within fifteen minutes she was placed in a room and oxygen kept up.

Physical Examination: At the time, it was noticed that the patient was a small thin elderly woman, quite irrational. Her talk was irrelevant.

Eyes: The pupils were small but reacted to light and accommodation. The fundi were not visualized.

Ears: Negative.

Mouth: There was a moderate amount of pyorrhea and caries. The tonsils were small, atrophic and buried. The tongue was coated and in the midline.

Neck: Thin and scrawny.

Chest Inspection: The respirations were quite shallow, about twenty per minute. Her chest was thin and of the ptotic type.

Palpation: Negative.

Percussion: There was a small area of dullness high up in the apical region, posteriorly, on the left. Below that was a small area of tympany.

Auscultation: Many fine mucous bubbly rales could be heard in the left apical region. The right chest was clear.

Heart: Blood pressure 80/60. Heart sounds were very faint. The pulse was small and feeble, but regular.

Abdomen: The skin was markedly striated from previous pregnancies. There were no masses.

Pelvic: Not done.

Extremities: No edema.

Reflexes: There was a suggestive Babinski of the right side. The patella reflexes were hyperactive and equal. There was no positive Kernig or Brudzinski.

Subsequent Course: The patient was very restless during the first day and was given several hypodermics of morphine sulphate, grains one-sixth. She was quite cyanosed most of the day. Her pulse was

100, respiration 18, temperature 98.6. During the evening she complained of being nauseated and she vomited several times, greenish fluid. At bedtime she was given 500 c.c. of 10 per cent glucose saline. She spent a very restless night. The next day she had several convulsions which were eclamptic in nature. The fingers of her hands became rigid; her eyes drew back and her pupils were markedly dilated; her body shook and there were generalized spasms, and her diaphragm became fixed. This convulsion lasted about a minute.. She was then given 20 c.c. of 15 per cent magnesium sulphate intravenously, and morphine sulphate grains one-sixth. This had no immediate effect. She called for her husband and screamed that she was unable to see. She was unable to follow any of us with her eyes. Examination of her eyes revealed myotic pupils, no attempt at visualization and a certain fixity of her eyes. Her pupils were dilated with homatropine. Examination of the fundi revealed no air emboli. She ceased to have convulsions after four P. M. that afternoon. The next day towards evening she became more quiet and was able to distinguish objects faintly. On the following day she was rational and was able to see very well. She did very well after that and further examination revealed no residual effects. Her blood pressure on discharge was 110/80. Her blood urea was 17.6, creatinine 1.4, Hb. 80, blood sugar 168, probably because of having gotten a glucose infusion previously. Spinal fluid examination was negative. Urine showed a faint trace of albumen and no acetone. It is thought that her blindness was due to emboli along the visual pathways probably in the occipital lobe of the cerebrum.

Case No. 2. The second case occurred in a thirty-nine-year-old white woman in the last stages of tuberculous cachexia with a massive pleural effusion in her right chest. She had been tapped three times at the angle of the scapula without touching fluid. X-ray had verified the clinical findings of massive pleural effusion with many adhesions at the base and a markedly irregular diaphragm. Upon being tapped the fourth time to relieve marked respiratory embarrassment, she became more cyanotic. The needle was immediately withdrawn and restorative measures applied. The patient coughed up frothy blood, had a series of clonic convulsions and ceased to breathe. No post-mortem was obtained.

CONCLUSIONS

1. Because of the likelihood of disaster, it is thought that relatives of the patient should be told of the untoward symptoms.

2. Despite the great care taken in doing a pneumothorax, accidents will occur.

3. It is believed that air embolism to the occipital lobe has occurred after pneumothorax.

Correspondence

Hidden Urethral Strictures.

FRANKTOWN, VA.,
JANUARY 27, 1938.

TO THE EDITOR:

There are thousands of old gonorrhea cases who have very serious strictures destroying their kidneys and ruining their health generally, besides keeping them up nights urinating. But since it comes on gradually, like the hour hand of a clock, they are unaware of their condition and have no idea at all of a stricture, claiming that they pass their water very freely indeed, when the opening is as small as a small sewing needle and the stream is perpendicular and almost drop by drop, and after finishing you can draw off a full quart of residual urine, even in young people. Well, I just think if we would keep our eyes open to these cases, we would relieve very many who claim to be very comfortable below the symphysis.

E. W. P. DOWNING, M. D.

Invitation to Washington Meeting.

1718 M STREET, N. W.,
WASHINGTON, D. C.,
MARCH 8, 1938.

TO THE SECRETARY:

The Medical Society of the District of Columbia will hold its Annual Scientific Assembly, May 4-5, 1938. An interesting well-balanced program is assured and includes several guest speakers.

We are writing you at this early date to ask you to make an announcement of the meeting before your Society at your meetings occurring prior to these dates and assist us in interesting as many of your membership as possible in spending these days in Washington attending the meetings.

An especially attractive feature of the meeting is the complimentary luncheon on Wednesday, May 4, for those registering. It has proved to be a popular

get-together for renewing old acquaintances and making new ones.

A banquet is also held on Thursday evening, May 5, and many also enjoy this function.

We sincerely hope members of your Society will be able to attend and spend these days in Washington.

We wish to thank you in advance for your help in bringing the dates of our meeting before the membership of your Society.

THE ATTENDANCE COMMITTEE,
J. LLOYD COLLINS, M. D.,
Chairman.

Woman's Auxiliary
to the
Medical Society of Virginia

President—MRS. JAMES B. STONE, 15 Maxwell Road, Richmond.
President-Elect—MRS. HAWES CAMPBELL, Venter.
Corresponding Secretary—MRS. LAWRENCE O. SNEAD, 5307 New Kent Road, Richmond.
Recording Secretary—MRS. JAMES K. HALL, 3011 Seminary Avenue, Richmond.
Treasurer—MRS. REUBEN F. SIMMS, 2502 Hawthorne Avenue, Richmond.
Chairman of Publicity—MRS. FRED J. WAMPLER, 4103 Forest Hill Avenue, Richmond.

Mid-Winter Board Meeting.

The Mid-Winter meeting of the Executive Board was held in Richmond on Wednesday, March 9 at 11 A. M., in the Miller Library Room of the Richmond Academy of Medicine Building. Sixteen members of the Board from various sections of the State were present. An interesting resumé of the activities of the Officers, Standing Committee Chairmen and County Presidents for the first half of their year's work was reported. Of particular interest is the fact that the New Constitution, By-Laws, and Handbook for County Auxiliaries has been completed by the Revision Committee, and was approved by the Board at this meeting. As soon as printing arrangements can be made, this most helpful guide will be printed in pamphlet form and ready for distribution.

Following the morning business session, the members were the guests of the President, Mrs. James B. Stone, for lunch at her home. Dr. Fletcher J. Wright, of Petersburg, Chairman of the Advisory Council, who was to have been the guest speaker at luncheon, was unable to attend. However, his message to the Board was read by Mrs. Stone. The Richmond Member of the Advisory Council, Dr. James B. Stone, who was in attendance, was pressed into service for a few remarks, and gave a very delightful inpromptu talk.

Doctors' Day.

A number of years ago the Southern Auxiliary suggested that a suitable day be set aside and observed by each Auxiliary, this day to be known as Doctors' Day. In Virginia this Day has annually been observed at some convenient time during the early Spring, and has been a part of the program of each County Auxiliary. Our President is urging each County Unit to have a Doctors' Day program in either April or May. This Day may be observed in any way that the local Auxiliaries desire. As a suggestion, it may be observed either by a memorial program to a local doctor who has passed on to a higher service, or by honoring some living member or members of the medical profession.

Letter to the Auxiliaries.

When this issue of the VIRGINIA MEDICAL MONTHLY reaches you the Virginia Auxiliary will have passed the half-way mark in its year's work. Under a new administration it takes some little while for the machinery of any organization to be set into motion. However, I feel that by now the State Auxiliary is running along smoothly, but we must not be satisfied with just that. We want to forge ahead and pick up speed on the last lap of our year's journey. Six months are left to us, and during that time comes the summer months, when some of our organized groups are not so active. Let's try not to have any "moratoriums" in Auxiliary work, but if some of you find it necessary to have some inactive months, let me urge you to double your efforts, and concentrate hard on Auxiliary work during the Spring and early Fall.

Again may I remind you of our project for the year, the Tuberculosis Sanatorium Bed. Last year because our bed was available to a doctor's daughter, her health was restored, and perhaps her life was actually saved! We are all intensely interested in tuberculosis work among the general public in the sections of the State in which we live, but let us not forget that our bed makes it possible

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for "one of our own", a doctor or his dependant, to have life itself in severe cases, and enables those afflicted with a milder type of the disease to enjoy a more healthful life. If you have not already done so, let me appeal to you to send in the contribution from your Auxiliary to Mrs. F. J. Wright, 49 S. Market St., Petersburg, Va., Chairman of this Fund.

It has been my pleasure to visit a number of our organized groups during the past few months. I should like so much to meet with each Auxiliary in the State before the expiration of my term of office, and hope that I may be accorded that privilege. There are many suggestions and much helpful information that I feel I could give by personal contact with the County Units. I welcome any suggestions that you may have and any constructive criticism which might accrue to the benefit of our organization. It is my earnest desire to be of every help possible to you. I hope that you will call upon me whenever I can be of assistance, for as your President it is my privilege not only to lead you, but to serve you as well.

Faithfully yours,

JANET WATKINS STONE,
President.

Public Health Statistics

I. C. RIGGIN, M. D.,
State Health Commissioner of Virginia.

The report of the State Health Department's bureau of communicable diseases, as compiled for the month of February, shows the following cases compared with the same month in 1937.

	1938	*1937*
Typhoid and Paratyphoid	6	11
Diphtheria	69	76
Scarlet Fever	154	143
Measles	2,035	861
Meningitis	17	32
Poliomyelitis	0	2
Rocky Mountain Spotted Fever	0	1
Typhus Fever	0	0
Undulant Fever	1	1
Tularemia	1	3
Smallpox	4	1

PNEUMONIA CONTROL FILM

A one reel dramatic motion picture with sound on pneumonia, entitled "A New Day", now is being shown to motion picture audiences throughout Virginia.

It depicts in an interesting manner the details which the general public should know regarding this devastating disease and its treatment. The necessity for the proper care of minor respiratory infection as a means of warding off possible serious complications is stressed. The reasons for prompt diagnosis and treatment by a physician early in the course of pneumonia also are explained. In addition, the efficacy of early sputum typing and of serum administration, as well as the importance of medical and nursing care, are clearly demonstrated.

While many excellent films dealing with health topics have been produced, this picture, sponsored by the United States Public Health Service and the Metropolitan Life Insurance Company, is the first one of its type specifically adapted for use in motion picture theaters.

The film was produced in Hollywood with a cast of well-known actors and tells an impressive story in the best Hollywood manner.

The picture is endorsed by the Pneumonia Commission of the Medical Society of Virginia and the State Department of Health. The cooperation of the theater managers has made this film available to the motion picture audiences. Reports indicate that the public not only is being informed but entertained by this significant experiment in motion picture health education.

ACTIVITIES IN THE VENEREAL DISEASE CLINICS

Conclusive proof of the part the fifty venereal disease clinics are playing in the control problem in Virginia is evidenced by a study of their activities during the past six months.

Patients made a total of 120,177 visits to the clinics either for treatment, diagnosis or advice. 5,104 cases of syphilis and 685 cases of gonorrhea were discovered. Treatments totaled 100,348, of which 58,288 were arsenical and 42,060 bismuth. Darkfield examinations were made on 358 persons. 2,929 smears for gonococci were taken and 39,584 blood tests made for syphilis.

That the required social service follow-up work is being done is indicated by the interviewing of 5,760 contacts and 18,365 visits to delinquents.

Incidentally, with a very few exceptions, the clinics limit their service to those unable to pay private physicians. A satisfactory interest in venereal diseases as a public health problem apparently is being developed.

Truth About Medicine

In addition to the articles previously enumerated, the following have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association:

Bilhuber-Knoll Corporation.

Metrazol Sterile Aqueous Solution, 10 per cent.

Hypodermic Tablets Dilaudid Hydrochloride, 1 mg. (1/64 grain).

Hypodermic Tablets Dilaudid Hydrochloride, 1.25 mg. (1/48 grain).

Lederle Laboratories.

Mixed Grasses Pollen Antigen—Lederle (June Grass, Orchard Grass, Sweet Vernal Grass, Red Top and Timothy in equal parts).

New and Nonofficial Remedies

Mead's Compound Syrup Oleum Percomorphum.—An emulsion of oleum percomorphum 0.65 per cent, olive oil 23.2 per cent, malt syrup 65.35 per cent, with water 8.1 per cent, alcohol 2.1 per cent, pectin 0.4 per cent and gum tragacanth 0.2 per cent (percentages by weight). The mixture is standardized by biologic assay to have a potency of not less than 780 U.S.P. vitamin A and 110 U.S.P. vitamin D units per gram. Mead Johnson & Co., Evansville, Indiana. (*J. A. M. A.*, February 19, 1938, p. 581.)

Accepted Devices for Physical Therapy

The following devices have been accepted by the Council on Physical Therapy for inclusion in its list of accepted devices for physical therapy:

General Electric Fever Cabinet.—This cabinet is designed to be used with the Inductotherm for maintaining heat during fever treatments. It does this by preventing excessive loss of heat from the patient's body, which rests in the cabinet during treatment. The patient's head protrudes through a rubber collar and rests on a pillow. By means of a fan, heater and water container the temperature and humidity within the cabinet are maintained at the desired level. General Electric X-Ray Corporation, Chicago. (*J. A. M. A.*, February 19, 1938, p. 581.)

Propaganda for Reform

Canadian Experience With Zinc Sulfate Sprays for Prevention of Poliomyelitis.—The serious outbreak of poliomyelitis in and around Toronto this year afforded an exceptional opportunity for the study of the prophylactic value of zinc sulfate sprays. The report by Tisdall and his co-workers (*Canad. Pub. Health J.*, November, 1937) on this subject deserves careful study. A trial of nasal spraying was approved by the Department of Health of Ontario on August 29. It was agreed that each child should be sprayed on two occasions, ten or twelve days apart, and that from 0.5 to 1 cc. of the solution should be placed in each naris in each spraying. The solution contained 1 per cent zinc sulfate, 1 per cent pontocaine and 0.5 per cent sodium chloride. The spraying was done according to the technic of Peet, Echols and Richter but differed from their recommended procedure in that it was not administered on three successive days, since this method was considered impracticable. The attack rate in the period from seven days after the first spraying to thirty days after the second spraying was 2.1 in the sprayed group and 2.9 in the control group. The difference is not statistically significant. The report concludes that since the spraying method employed in this study must be conducted by otolaryngologists or other physicians especially trained in intranasal treatment, requires special facilities, and cannot be done quickly enough to meet the emergency of an outbreak, it cannot be considered a practical public health procedure. (*J. A. M. A.*, December 18, 1937, p. 2072.)

Vitamin D Milk Produced by Feeding Cows Irradiated Yeast.—In 1929 Wachtel reported that the feeding of irradiated dried yeast to cows resulted in the secretion of vitamin D in the milk. This report was confirmed and amplified by the observations of Hart and Steenbock and their associates at the University of Wisconsin. Since 1932 this type of vitamin D milk has been made commercially available. The product is sometimes referred to as "metabolized" vitamin D milk. Numerous investigators have reported on the clinical effectiveness of metabolized vitamin D milk. These investigators have shown that, if there is any difference, unit for unit, between different types of vitamin D milk, the difference is too small to be of practical significance. Metabolized vitamin D milk is produced under the joint sponsorship of Standard Brands, Incorporated and the Wisconsin Alumni Research Foundation. The irradiated dried yeast intended for use in the feeding of cows may be sold by Standard Brands, Incorporated only to dairymen licensed by the Wisconsin Alumni Research Foudation. The vitamin D content of the milk produced, as shown by repeated bioassays, is not less than 400 units of vitamin D per quart. The Council on Foods voted to accept pasteurized metabolized vitamin D milk and to grant the use of the seal of acceptance to licensed dairies that conform to the Rules and Decision of the Council. (J. A. M. A., November 27, 1937, p. 1814).

Book Announcements

Injection Treatment of Hernia. By CARL O. RICE, M. D., F. A. C. S., Instructor in Surgery, University of Minnesota School of Medicine; Surgeon in Charge of the Surgical Out-Patient Department of the Minneapolis General Hospital; etc. With the assistance of HAMLIN MATTSON, M. D. Philadelphia. F. A. Davis Company. 1937. Octavo of ix-266 pages. 83 illustrations. Cloth. Price, $4.50.

This book of 250 pages is divided into eleven chapters. The first chapter gives the history of the injection treatment of hernia and, therefore, is of some interest. In the next four chapters the classi-

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fication of hernias, the anatomy of the areas in which hernia usually appears, the etiology, and diagnosis of hernia are fully discussed. These chapters are well-written and most of the ideas expressed are generally accepted by the medical profession. These chapters make this book worthwhile to the young surgeon, even though he may be only mildly interested in the injection treatment of hernia.

In chapter six the five main types of trusses are described and their advantages and disadvantages discussed. This chapter is of value to the surgeon, for there is little doubt that in some cases of hernia the application of a well-fitted truss is the treatment of choice.

Chapter seven contains a description of the armamentarium and technique for the injection treatment of hernia. Considerable space is devoted to a discussion of the various solutions which have been tried and the trade names of some of the solutions are used. In some instances, this was done apparently because the formula of the solutions was not available. Under such circumstances it would have been advisable to consider only those solutions of known composition.

Chapters eight and nine are devoted to a discussion of the complications and sequelae and to the results of this method of treatment. In the discussion of results, the author does not make clear how long a time must elapse before the patient is considered cured; but apparently a year is considered sufficient, for he refers to the statistics published by Gibson and Fletcher which indicated that approximately 73 per cent of recurrences following surgical repair developed during the first year. However, the statistics published recently by Burdick[1] *et al.* showed that 62 per cent of the recurrences developed after the first year.

In chapter ten the author describes the histopathology of tissue removed at varying periods of time after the injections and presents a number of good photomicrographs of such tissue.

The final chapter contains a valuable summary of the medico-legal aspects of hernia and the compensation laws in the various states in relation to hernia.

I. A. BIGGER.

1. Ann. Surg., 106: 333, 1937.

Mental Therapy. Studies in Fifty Cases. By LOUIS S. LONDON, M. D., Formerly Passed Assistant Surgeon (R) United States Public Health Service; Medical Officer United States Veterans Bureau; Assistant Physician Central Islip State Hospital, Central Islip, N. Y., and Manhattan State Hospital, Wards Island, N. Y. In Two Volumes. Covici, Friede, Inc. New York, N. Y. 1937. Volumes I and II— Octavo of 774 pages. Cloth. Price, $12.50.

One is somewhat surprised at the title of the book, which on the outside is simply "Mental Therapy," in comparison to the contents, because the whole of the two volumes is devoted to the study of mental diseases from a psychoanalytic and psychotherapeutic standpoint. No space is given to physical consideration or to endocrine therapy. One would rather look for such new things as have been introduced in mental therapy as hyperthermia and insulin treatment in two volumes of this title. Nothing of this sort is taken up at all. From the psychoanalytic side of the psychosexual school with a recitation of fifty cases, the work is valuable. It is certainly not a book for undergraduate students, and possibly it would be best for reference use for those who are limiting their practice to this particular phase of medicine. Those practicing in branches not directly related to that part of mental medicine concerned with psychoanalysis would probably not understand the book. The question as to the percentage of psychiatric cases that come under the Freudian sex classification is an open one.

Dr. London has held many important positions under the government and in state hospitals and his cases are well worked out and reported. The work constitutes, therefore, a contribution from the case history of the psychoanalytic viewpoint to the particular subject to which it is addressed, but one cannot help from wishing that Dr. London, like Dr. Oskar Diethelm in his book, "Treatment in Psychiatry," would write a competent treatise on the therapy of psychiatric disease in general bringing in the newer ideas of insulin shock therapy, prolonged sleep therapy, lobectomy, and the various methods of hyperthermy.

BEVERLEY R. TUCKER.

Virginia Medical Monthly

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WYNDHAM B. BLANTON, M. D., *Editor*
AGNES V. EDWARDS, Richmond, *Business Manager*

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VOLUME 65 APRIL, 1938 No. 4

Editorial

Wanted—An Antipruritic.

The author of *Iife and Death* now gives us *More of My Life.* The first named book is an autobiography and only a rash man writes a life of himself unless he stands upon the threshold of the Hereafter over which he can quickly jump to escape the darts of criticism. The second volume, as its title suggests, is an effort to make another book out of the scraps that fell from the first. Like a hash made from Sunday's chicken it may do very well for family consumption but it will not do to set before a guest. Andrea Majocchi is an Italian surgeon, his publishers would have us believe of international reputation. In his writing there is the love of the dramatic and the deep emotionalism of a devout churchman. Is there no antipruritic for the itch of autobiographical writing? It looks as if an increasing number of surgeons and doctors need a dose for what ails them.

The Virginia Academy of Sciences.

Last month's issue of the *Virginia Medical Monthly* carried a letter by Dr. J. Shelton Horsley pointing out what he thought should be the future policy of the Section on Medical Sciences of the Virginia Academy of Science. He advocated more clinical papers of a sort that are not commonly given at medical meetings, brief clinical observations of the kind that the general practitioner is capable of making without laboratory or mechanical aids, bedside observation in anatomy, physiology, embryology and the other fundamental sciences.

Dr. Horsley's letter gives us the opportunity to remind the medical profession of Virginia of the fine accomplishments of the Virginia Academy of Science and to urge upon interested doctors the opportunity the Academy affords for service in this State. Seventy doctors are members. There is room for many more.

"The Virginia Academy of Science was organized in May, 1923, through the pioneer initiative of the Society of Virginia Biologists at their fourth annual meeting at the College of William and Mary. Since that time the Academy has enjoyed a phenomenal growth until now it represents the creative effort and official expression of the vast majority of scientists in the Commonwealth.

"At its annual meetings, held each May at academic centers easily accessible to all, the teachers of science and other science lovers in the State gather to hear the latest research in all fields presented. In the seven sections of the Academy, papers of rich and varied interest are read, new experimental apparatus is demonstrated, scientific films are shown and vital discussions of research topics are held. At the public sessions, nationally-known scientists from outside the State are the guest speakers.

"The cause of science is served through the stimulus to more and better research work and through

the cross-fertilization of scientific ideas afforded by the meetings. Finally, the scattered efforts of the individual members when brought together in the Academy program make possible a dignified presentation of the scientific work that is being currently done in the State of Virginia.

"The Academy invites to membership all persons interested in the promotion of science and the scientific spirit in Virginia.

"The Academy is affiliated with the American Association for the Advancement of Science and in working agreement with the other State academies of science.

"The Research Committee awards at each meeting of the Academy, a prize of fifty dollars for an especially meritorious paper presented at that meeting and it makes cash awards to various persons who need equipment or supplies for the successful pursuit of some worthy scientific project. It also awards the Jefferson Gold Medal."

Alcohol, the Legislature and a Book.

Another curious by-product of the recent sojourn of the Senate and the House of Delegates in the capital of Virginia was the discussion and final action of the Legislature over a book compiled at its direction by Dr. J. A. Waddell of the University of Virginia and Dr. H. B. Haag of the Medical College of Virginia on *Alcohol in Moderation and Excess*. It was never made certain whether those who voted against publishing this report in book form to be used "as a basis for material to be taught in the public schools" had read it or not. The only thing that was apparently clear was that those who are against alcohol quantitatively and qualitatively were more concerned with obtaining a condemnation of alcohol's effects upon the human body under all circumstances, than they were in securing an authoritative study of the effects of alcohol in varying concentration upon the human system.

Fortunately the William Byrd Press has rescued Drs. Waddell and Haag's book from the oblivion to which the action of the General Assembly was calculated to consign it, have published it, and offer it for sale at $1.00 a copy.

Between its neat covers there are 184 pages of simple, concise facts presenting the truth about the manufacture of alcohol and its action on the various systems of the body in moderation and in excess. The book is not propaganda and should be useful to all those seeking reliable information regarding a most important chemical with industrial, scientific and domestic uses of vast importance and with still more important social implications.

Moral Aphonia.

Mr. Frank P. Moncure of Stafford County, Virginia conceived the notion that people living in Virginia who were insane, who were infected with tuberculosis in the communicable stage, or who had gonorrhea or syphilis should not be allowed to marry and spread these diseases. Of course it was unusual for a layman to feel this way, and it was rather dangerous to think of a statutory amendment to the code of Virginia which would interfere with personal liberty to the extent of rendering the spread of infection or the transmission of insanity through marriage impossible. Nevertheless, Mr. Moncure persisted and his bill got into the Calendar of the House of Delegates. Mr. Moncure must have been surprised to find that not only were there laymen but that there were physicians who took issue with him upon the soundness of the proposed legislation. Being a practical politician, Mr. Moncure trimmed his bill to meet the opposition it encountered, and in its final form it was reduced to a measure which proposed simply to prevent those infected with syphilis from marrying, and had it passed in this form it would very materially have assisted in the state-wide campaign to eradicate Lues from Virginia. But Mr. Moncure's bill was defeated. He is said to have attributed his failure to win enough votes to enact his desired law to the influence of certain petty officials back home who somehow had calculated that a law which would require examination prior to marriage, and prevent those infected with syphilis from marrying, among a people 10 per cent infected with syphilis, would seriously reduce the incidence of marriage in their respective localities, which in turn would materially affect the incomes derived from issuing marriage licenses. We are inclined to believe that the failure of this bill was due to lack of understanding of the seriousness of the problem of syphilis by the laiety, and to a gross failure on the part of the medical profession to assume a militant and aggressive attitude when matters of grave public concern over which they are the final arbiters are presented to the General Assembly. On matters like this the Medical Society of Virginia must speak and speak fearlessly. Local

medical societies must educate their localities and two years hence such a bill as this will pass the Virginia Legislature without serious opposition.

Another Matter for Legislation.

Several months ago readers of the most respectable *American Journal of the Medical Sciences,* oldest of our medical periodicals, blinked and rubbed their eyes to find an article dealing in a scientific manner with the manufacture of contraceptives, the fraud and safety of these products.

About the same time one of America's *de luxe* magazines published an article, purporting to have the endorsement of the editor of the *Journal of the American Medical Association,* "in the interests of the health and well-being of persons who are exposed to the products of the birth control industry," scrutinizing what is said to be a $250,000,000 business for "social responsibility" and for the need of some rather drastic legislation.

The first article made it plain that only very few mechanical contraceptives are made of reliable material. The second article pointed out what an enormous industry this birth control business has become with its "636 known brands of products and devices for the female, put up by the million in bottles, tubes, jars and boxes," and what unconscionable profits adhere in the sale of all types of contraceptive apparatus. The announcement in the fall of 1937 by the Federal Food and Drugs Administration that the standards of quality of these products "are subject to the same scrutiny as those of a drug" was an important forward step. Since the American Medical Association has now recognized birth control as a legitimate concern of the medical profession there is hope not only that its proper technique may be popularized in the profession but that the pitfall of worthless materials and the passion for profiteering among those who handle these goods may be brought under legislative control.

Department of Clinical and Medical Education of the Medical Society of Virginia

Obstetrics and Gynecology.

During the five weeks period from February 14 to March 19, Dr. Shamburger has conducted a postgraduate course in the City of Danville and the counties of Bedford, Campbell, Pittsylvania, and Henry. Meetings were held at Bedford, Altavista, Chatham, Danville, and Martinsville. Up to the time of writing this report the following doctors have attended the course:

BEDFORD

Dr. W. V. Rucker — Dr. E. L. Johnson
Dr. J. G. Jantz — Dr. T. P. West
Dr. M. P. Rucker

ALTAVISTA

Dr. Q. H. Barney — Dr. W. O. Smith
Dr. E. F. Neal — Dr. J. P. Kent
Dr. C. W. Haden — Dr. Carleton Moorman
Dr. L. D. Morgan — Dr. A. M. Owen

DANVILLE

Dr. P. W. Miles — Dr. J. L. Nall
Dr. I. C. Harrison — Dr. H. J. Langston
Dr. W. C. Yeatts — Dr. Walter McMann
Dr. W. B. Sager — Dr. Wharton
Dr. J. J. Neal — Dr. R. W. Garnett
Dr. J. W. Robertson

CHATHAM

Dr. B. R. Allen — Dr. G. V. Thompson
Dr. C. D. Bennett — Dr. W. J. Wigington
Dr. H. H. Hamner — Dr. J. C. Anderson

MARTINSVILLE

Dr. J. A. Shackelford — Dr. C. R. Titus
Dr. F. B. Teague — Dr. M. H. Mund
Dr. D. H. Mason — Dr. J. M. Shackelford
Dr. J. W. Simmons — Dr. Wilson
Dr. A. W. Rucker — Dr. E. M. McDaniel
Dr. A. C. Stutsman — Dr. D. L. Fleshman

Plans are now being made for the next circuit to be held in Orange, Albemarle, and Augusta counties beginning the week of March 28.

Pediatrics.

Dr. Hightower at this time is completing a circuit in the Northern Neck of Virginia. Meetings have been held at Fredericksburg, Oak Grove, Warsaw, Heathsville, and Kilmarnock. The following doctors have been in attendance:

FREDERICKSBURG

Dr. T. B. Payne — Dr. E. R. Ware
Dr. T. W. Dew — Dr. W. M. Junkin

XUM

OAK GROVE

Dr. V. O. Carruthers, Jr. Dr. E. F. Gouldman
Dr. C. G. Williams

WARSAW

Dr. J. H. Hare Dr. E. T. Ames
Dr. H. L. Segar Dr. V. L. Litsinger
Dr. W. N. Chinn

HEATHSVILLE

Dr. R. E. Booker, Sr. Dr. H. Mooers
Dr. R. E. Booker, Jr. Dr. W. B. Richardson
Dr. C. T. Pierce Dr. B. H. Hubbard
Dr. R. L. Hudnall

KILMARNOCK

Dr. M. C. Oldham Dr. H. W. Kinderman
Dr. E. R. Moorman Dr. C. T. Pierce
Dr. P. E. Lilly Dr. L. S. Liggan

During the period from March 21 to April 23, Dr. Hightower will conduct a course in the Mid-Tidewater area. Arrangements have been made for meetings to be held at Bowling Green, Tappahannock, Saluda, Gloucester, and West Point.

Internal Medicine.

The Department of Clinical and Medical Education is now in a position to offer a few short courses in Internal Medicine in various communities of the State. In these courses the instructors will be drawn from the two medical schools of the State. Local societies wishing to have a course offered should communicate with the Executive Secretary. Preference will be given to those societies making the first requests.

When requesting these courses it is suggested that local societies specify the topics they wish discussed. Since only a few courses in this subject can be offered this year it is important that requests be made as early as possible.

GEORGE B. ZEHMER,
Executive Secretary.

Proceedings of Societies

Botetourt County Medical Society.

At the meeting of this Society on March 12, Dr. S. F. Driver of Troutville was elected president, and Dr. W. H. Saunders of Fincastle was named secretary for the coming year.

Fourth District Medical Society.

At the meeting of the Fourth District Medical Society, held on February 15, in Hopewell, the following scientific program was presented: Report of a Case of Primary Streptococcic Peritonitis by Dr. W. M. Phipps; Uses and Dangers of Sulfanilamide by Dr. F. M. Howell; and Serum Therapy of Pneumonia by Dr. C. I. Pirkle. All of these doctors are from Hopewell. Dr. J. Newton Dunn of Blackstone was elected to membership. Dr. J. L. Hamner, Mannboro, is president of the Society and Dr. C. E. Martin, North Emporia, secretary.

James City-New Kent County Medical Society.

At the annual meeting of this Society recently, Dr. E. B. Kilby of Toano was elected president, and Dr. I. S. Zfass of Williamsburg, secretary.

The Lynchburg Academy of Medicine

Held its regular meeting in the Elks' Club, March 8, at 8:00 P. M., with the President, Dr. Elisha Barksdale, presiding. Drs. Claude Gibson Hooten of Lynchburg and Dennis H. Robinson of Bedford, were elected to membership.

Dr. J. Edwin Wood of University of Virginia presented an extremely interesting and instructive paper on "Body Weight and Hypertension," showing their experimental work on dogs in relation to hypertension and body weight.

All-Day Clinic.

Drs. N. F. Rodman, chairman, A. B. Hodges, C. C. Smith and M. S. Andrews formed the committee in charge of the Annual All-Day Clinic of the Norfolk County Medical Society on March 28. Clinics were held at St. Vincent's Hospital in the morning, followed by a clinical conference with Dr. T. A. Boggs, associate professor of medicine at Johns Hopkins University, in charge. Luncheon was served those attending as a courtesy of the Norfolk General Hospital, after which a surgical clinic was held there and a medical clinic at St.

Vincent's. Following dinner at Town Club, an evening session was held at which the invited speakers were Dr. Hubert A. Royster of Raleigh, N. C., and Dr. Joseph Stokes, Jr., associate professor of pediatrics and physician-in-chief at the Children's Hospital in Philadelphia.

The Orange County Medical Society

At its February meeting voted a change from the monthly plan of meeting to a quarterly schedule, as it was the feeling of most of those present that with a small membership more could be accomplished in the line of helpful programs by having fewer meetings, and making these more interesting and worthwhile.

At the April meeting, Dr. Lewis Holladay of Orange will have charge and give as his paper "The Problems of the Rural Physician of Yesteryear".

Richmond Academy of Medicine.

At the meeting of the Academy on March 8, Dr. Wright Clarkson of Petersburg spoke on "Cancer Control in Virginia". This address was followed by a case report on "Pneumococcus Vaginitis" by Dr. William Bickers, and a paper on the "Diagnosis and Treatment of Tuberculous Lesions of the Tracheobronchial Tree" by Dr. Porter P. Vinson.

Speakers at the meeting on March 22 were Dr. Walter L. Nalls on "Chronic Cyst Disease of the Lung"; Dr. Charles M. Nelson on "The Cause of Chills Following Intravenous Therapy"; and Dr. Joseph Bear on "Further Comments on Human Sterility". The usual buffet supper followed both meetings.

New members elected at these meetings are: Dr. Homer E. Ferguson, Dr. B. A. Hord, Dr. Richard C. Neale, and Dr. L. L. Shamburger.

Roanoke Academy of Medicine.

At the March meeting of the Academy, the following program was presented: Dr. Thomas N. Spessard on "Hysteria"; Dr. Roy M. Hoover on "Colles' Fracture"; Dr. W. L. Powell on "Fissure in Ano"; and Dr. K. D. Graves on "Report on Tuberculosis Survey".

Dr. N. A. Beeton, Vinton, was recently elected to membership.

The Southside Virginia Medical Association

Met in Franklin on March 15, with about fifty doctors in attendance. A most interesting and instructive program was arranged and the papers and discussions which followed were much enjoyed. At the conclusion of the program, the visiting physicians were entertained at a delightful dinner at the Stonewall Hotel.

The next meeting will be held at the Central State Hospital in Petersburg on the second Tuesday in June.

Dr. W. J. Ozlin of South Hill is president of this Association and Dr. R. L. Raiford of Franklin, secretary.

News Notes

Committees for State Society Meeting.

It was recently announced that Dr. I. C. Harrison had been appointed general chairman in charge of local arrangements for the meeting of the Medical Society of Virginia in Danville, October 4, 5, and 6. The following have been appointed to serve with him:

Halls and Hotels: Drs. P. W. Miles and H. A. Wiseman

Commercial Exhibits: Drs. J. J. Neal and R. W. Upchurch

Scientific Exhibits: Drs. E. E. Barksdale and Charles W. Purcell

Entertainment: Drs. E. H. Miller and J. M. Robinson

Ladies: Mrs. James C. Giles

These committees have already started their work and a "big" meeting is anticipated.

Medical College of Virginia News.

The third in the series of symposia put on by the various school of the college in celebration of the Centennial year will be given by the school of nursing on April 11, 1938.

During the morning there will be a series of papers given by members of the nursing faculty of the college, and luncheon will be served at noon for visitors and alumnae. During the afternoon tours will be made of the hospital division and other units of the institution.

XUM

At night there will be a general meeting at the John Marshall High School auditorium with President W. T. Sanger, presiding. Dr. Roshier W. Miller, president of the general alumni association, will extend greetings from that association. Dean Frances Helen Zeigler of the school of nursing will review the history of the nursing school and introduce the guest speaker of the evening, Miss Sophie C. Nelson, R. N., who will speak on "Nursing—Old and New".

The fourth and final symposium will be combined with the annual Stuart McGuire lectures, April 28 to 30.

The symposium will be conducted by a group of distinguished guests from important medical centers. On April 28 at 8:30 P. M., Dr. George R. Minot, Professor of Medicine, Harvard Medical School, and Director of the Thorndike Memorial Laboratory, will speak on "The Etiology and Treatment of Anemia".

On the morning of April 29, beginning at ten o'clock, Dr. O. H. Perry Pepper, Professor of Medicine, University of Pennsylvania School of Medicine, will speak on "A Survey of the So-Called Hemolytic Anemias", followed by Dr. Harvey E. Jordan, Assistant Dean of the Department of Medicine and Professor of Histology and Embryology, University of Virginia, speaking on "Blood Formation in Birds with Special Reference to the evidence for a Genetic Relation Between Lymphocytes and Erythrocytes". In the afternoon, Dr. Nathan Rosenthal of Mt. Sinai Hospital, New York City, will speak on "Leukemoid Reactions in Various Diseases", and will be followed by Dr. Alexis F. Hartmann, Associate Professor of Pediatrics, Washington University School of Medicine, on "Some Clinical Studies of Subjects with Change in their Acid-Base Balance." At night Dr. George R. Minot will give a second lecture on "Nutritional Deficiencies".

On Saturday morning, April 30, Dr. Edward D. Churchill, John Homans Professor of Surgery, Harvard Medical School, will speak on "The Principles of Surgical Treatment of Hyperparathyroidism", followed by Dr. Harvey B. Stone, Associate Professor of Surgery, Johns Hopkins University School of Medicine, speaking on "Transplantation of Parathyroid Glands". At noon Dr. Walter Bauer, Assistant Professor of Medicine, Harvard Medical School, will speak on "The Nature of Degenerative Joint Disease (Hypertrophic Arthritis)".

Dr. J. C. Coulter,

Charlottesville, was one of the principal speakers at the meeting of the Tri-City Association of Odd Fellows, held in Petersburg, on March 8.

Dr. F. L. Thurman,

Buena Vista, at a recent meeting of the Natural Bridge Chapter of the Daughters of the American Revolution, read a paper on "Some Historical Homes in Rockbridge County Around the Period of the Revolutionary War".

"Let's Go To California".

Let's go on the American Express Travel Tour on the Physicians' De Luxe Special Trains which leave Chicago on June 6. We'll arrive in time for the San Francisco Convention of the American Medical Association but en route will see the Indian Detour, Grand Canyon, Los Angeles, Riverside, and Santa Catalina Island. After leaving San Francisco, it will be a problem to know which route to take as there are two—one takes us via Portland, Seattle, Victoria, Vancouver, Canadian Rockies, Lake Louise and Banff Springs—the other via Yellowstone National Park, Salt Lake City, Royal Gorge, Colorado Springs and Denver.

No physician wants to miss the meeting of the American Medical Association and no physician can afford to miss seeing "America En Route". The Special De Luxe trains have the most modern air conditioned equipment, including Pullman sleeping cars, drawing rooms, buffet club car, combination lounge and observation car and diners—everything that is necessary for a most enjoyable time.

Have you received your folder with full information about the tour? If not, write the American Express Travel Service, 1414 F St., N. W., Washington, D. C. They will be glad to help you.

American College of Physicians.

The twenty-second annual session of the College is being held in New York, April 4-8, at the Waldorf-Astoria, under the presidency of Dr. James Howard Means, of Boston.

Dr. Joseph E. Cox,

Who graduated in medicine from the University of Virginia in 1934, has located in Waynesboro where he is limiting his practice to pediatrics.

Local Health Department News.

The Prince William County Health Department

has been organized and was officially opened on February 16, with headquarters at Manassas. Dr. E. M. Holmes, Jr., health officer of the Fairfax County Health Department, is directing the activities of the Department until the regular director is appointed.

The Prince George-Hopewell Health Department has been organized and was officially opened March 1, with headquarters at Hopewell. Dr. J. H. Bonner has been appointed health officer of this new department.

Dr. Francis J. Clements, recently of Palmyra, has been appointed health officer of the Sussex County Health Department, effective March 15, succeeding Dr. John H. Bonner who was transferred to the Prince George-Hopewell Health Department.

Promotions in U. S. Public Health Service.

Among recent promotions in the U. S. Public Health Service, the following are graduates of the University of Virginia, School of Medicine:

Dr. Marion F. Haralson, class of 1915, promoted and commissioned as Senior Surgeon in the Regular Corps.

Dr. Thomas A. Moneymaker, class of 1933, promoted and commissioned as Passed Assistant Surgeon in the Reserve Corps for active duty at the U. S. Employees' Compensation Commission.

Appointment at New York Polyclinic.

Dr. Joseph F. McCarthy has been appointed professor of urology and attending urologist to the New York Polyclinic Medical School and Hospital.

Dr. Carl W. LaFratta

Announces the removal of his office to 1630 West Grace Street, Richmond.

Invitation to Washington Meeting.

Under the department of *Correspondence* in this issue of the MONTHLY appears an invitation for our members to attend the annual scientific assembly of the Medical Society of the District of Columbia. An interesting program has been arranged and we hope many of our members may avail themselves of this opportunity.

Dr. James W. Smith,

Hayes Store, has been appointed to the Board of Health of Gloucester County by State Health Commission, Dr. I. C. Riggin.

Dr. Smith has also been elected as a member of the Board of the Virginia Salt-Water Fishing Association from his county.

Dr. B. J. Montgomery

Of Baskerville has been named as one of the directors of the Mecklenburg Cooperative Electric Company, organized recently.

Parke, Davis & Company Elects New President and New Finance Chairman.

Dr. A. William Lescohier was elected President of Parke, Davis & Company, and Norman H. F. McLeod Chairman of the Finance Committee, at a meeting of the Company's Board of Dirctors in Detroit on March 1. Both men have been actively connected with the Company for about thirty years.

Dr. Lescohier succeeds Oscar W. Smith, who had been President of the Company for sixteen years until his death on February 7 of this year. Mr. McLeod continues as Secretary and Treasurer of the Company, as well as a Director, in addition to his new post as Chairman of the Finance Committee.

Dr. L. G. Roberts

Of Moormans River, member of the Albemarle County Board of Supervisors, has been selected to succeed Mr. Raymond L. Jackson, resigned, as county chairman of the local Democratic committee.

Dr. Allen Barker,

Petersburg, recently spoke before the Kiwanis Club of that city on the development and modern uses of X-ray.

Dr. James B. Shuler,

Class of '35, University of Virginia Department of Medicine, who has been stationed at the U. S. Naval Medical School in Washington, has been transferred to the Marine Detachment, Rifle Range, at Cape May, N. J.

Dr, William S. Burton,

Who interned at Johnston-Willis Hospital, Richmond, after his graduation from the Medical College of Virginia last year, has located at Powhatan, where he has taken over the practice of the late Dr. J. E. Tilman.

Dr. N. D. Nelms,

Class of '36, University of Virginia Department of Medicine, who later interned at Elizabeth Buxton Hospital, Newport News, has located at Mathews where he is engaged in general practice.

XUM

Dr. Charles Preston Mangum,

Richmond, announces removal of his office to 1822 Monument Avenue, this city. His practice is limited to pediatrics.

International Health Broadcast on Heart Disease in Children.

Leading British and American physicians, 6,000 miles apart, will confer via the radio on the greatest menace to child health, Rheumatic Heart Disease. This conference, the first international broadcast on any health problem, will be heard over the National Broadcasting Company, WEAF and the Red Network, on Monday evening, May 2, at seven thirty o'clock Eastern Daylight Saving Time. Arranged by the American Heart Association, the conference-broadcast will observe National Child Health Day.

Lord Thomas Jeeves Horder, Physician-in-ordinary to the King of England, will open the conference speaking from London. Dr. Homer F. Swift of the Rockefeller Institute, New York City, and Dr. T. Duckett Jones (son of Dr. and Mrs. J. Bolling Jones of Petersburg) of the House of the Good Samaritan, Boston, will then speak from Atlantic City where they will be attending the convention of the American Society of Clinical Investigation. Dr. William J. Kerr, President of the American Heart Association, will take up the discussion from San Francisco.

McGuire Unit Holds Annual Meeting.

The Veterans of the United States Hospital Base No. 45, known as the McGuire Unit, held their annual meeting at St. Luke's Hospital, Richmond, on February 26. All physicians, enlisted personnel and nurses, who served with the McGuire Unit overseas during the World War, are members of the organization and Dr. Stuart McGuire is the Honorary Commander. Dr. Greer Baughman, retiring commander, presided at the banquet which was attended by approximately seventy-five members. Mr. Robert Quarles was elected commander and Dr. William B. Porter vice-commander.

Married.

Dr. Thomas Morton Raines, Wakefield, and Miss Alice Virginia Hill, Dendron, February 24.

May Day—Child Health Day 1938.

"Speed Children on the Road to Health" is the slogan of the 1938 May Day—Child Health Day—to be observed on May 1. The objective is for every community to make full use of its resources in order to insure to children safe birth, normal growth, and protection against disease and accident in their progress from infancy to maturity. For information on State programs, write to State May Day Chairman, State Department of Health, Richmond.

Dr. Quinton E. Cooke,

Of the Medical College of Virginia, class of '37, who interned for a time at Johnston-Willis Hospital and was resident at Pine Camp Hospital, Richmond, has located for general practice in Murfreesboro, N. C.

The American Association on Mental Deficiency

Is to hold its sixty-second annual meeting in Richmond, Va., April 20 to 23, inclusive, with headquarters at the Jefferson Hotel. In addition to the business sessions, there will be presented a number of interesting papers, round table discussions, demonstrations and exhibits. In the way of diversion, sight-seeing trips to places of interest near Richmond have been arranged and there will be the President's dinner with dancing and cards on the evening of the 22nd. Dr. Harry C. Storrs of Thiells, N. Y., is president, and Dr. E. Arthur Whitney of Elwyn, Pa., secretary. All doctors in Virginia are invited to attend the sessions.

Dr. Marion B. Sulzberger,

Professor of clinical dermatology and syphilology at Columbia University, New York, was the guest speaker before the Norfolk County Medical Society on March 21, his subject being "The Management of Common Dermatoses by the General Practitioner".

The Academy of Dermatology and Syphilology

Was organized at a meeting held in Detroit on January 14 and 15, which was attended by more than three hundred dermatologists. Dr. Howard Fox of New York was elected president, and Dr. Earl D. Osborne, of Buffalo, secretary.

Dr. H. Hudnall Ware, Jr.,

Richmond, announces removal of his offices to 816 West Franklin Street, this city, effective April 1.

Spring Graduate Course.

The Gill Memorial Eye, Ear and Throat Hospital of Roanoke is to hold its twelfth annual Spring

Graduate Course in Opthalmology, Otology, Rhinology, Laryngology, Facio-Maxillary Surgery, Bronchoscopy and Esophagoscopy from April 4 to 9. In addition to the doctors of the Hospital Staff, the faculty includes twelve prominent specialists from the eastern states. The class, which is limited to fifty, is listed below:

Dr. Byron B. Bobb, Harrisburg, Pa.
Dr. Karl S. Blackwell, Richmond, Va.
Dr. Hugh J. Baker, Hamilton, Ohio.
Dr. Ben W. Bird, Princeton, W. Va.
Dr. Arthur A. Bobb, Reading, Pa.
Dr. A. L. Bass, Louisville, Ky.
Dr. L. M. Coffey, Peoria, Ill.
Dr. S. M. Cottrell, Richmond, Va.
Dr. G. E. Campbell, Johnson City, Tenn.
Dr. C. J. Chamberlin, Hamilton, Ohio.
Dr. Frank W. Dimmitt, Providence, R. I.
Dr. Gerald F. Denyes, Toledo, Ohio.
Dr. H. Eugene Douds, Beaver Falls, Pa.
Dr. John P. Donahoe, Scranton, Pa.
Dr. H. C. Eastman, Galesburg, Ill.
Dr. Wallace W. Gill, Richmond, Va.
Dr. Milus L. Gunn, Harlan, Ky.
Dr. J. H. Hester, Louisville, Ky.
Dr. C. M. Hawes, Huntington, W. Va.
Dr. Carl C. Koester, Batavia, N. Y.
Dr. J. C. Kanigsberg, Freeport, N. Y.
Dr. Edwin R. Lescher, Elgin, Ill.
Dr. C. D. Miller, Carbondale, Pa.
Dr. Edward L. McCarthy, Canonsburg, Pa.
Dr. M. H. Newton, Little Falls, N. Y.
Dr. T. J. Overstreet, Lexington, Ky.
Dr. Hugh H. Richeson, Louisville, Ky.
Dr. J. W. Raymond, Johnstown, Pa.
Dr. Charles Roser, Louisville, Ky.
Dr. J. H. Simpson, Louisville, Ky.
Dr. Chas. D. Sneller, Peoria, Ill.
Dr. J. T. Shelburne, Martinsville, Va.
Dr. W. Hamilton Smith, Hagerstown, Md.
Dr. D. E. Staton, Columbus, Ohio.
Dr. J. Allen Smith, Macon, Ga.
Dr. E. W. Tucker, Fairfield, Ala.
Dr. F. W. Urton, Louisville, Ky.
Dr. K. L. Van Horn, Parkersburg, W. Va.
Dr. Minor E. White, Kankakee, Ill.
Dr. Claude T. Wolfe, Louisville, Ky.
Dr. Wm. R. Weisiger, Richmond, Va.
Dr. Otis M. Wilson, Wausau, Wisc.
Dr. A. G. Wilde, Jackson, Miss.
Dr. E. Vermillion, Welch, W. Va.
Dr. J. R. Vermillion, Princeton, W. Va.
Dr. C. C. Swann, Asheville, N. C.
Dr. John B. Gooch, New Orleans, La.
Dr. Merle Russell, Erie, Pa.
Dr. H. H. Morris, Portsmouth, Ohio.
Dr. Thomas E. Hughes, Richmond, Va.

Dr. Winfred Overholser,

Recently appointed superintendent of St. Elizabeth's Hospital, Washington, D. C., has been named as professor of psychiatry and executive officer of the department of psychiatry at the George Washington University, School of Medicine, effective September, 1938.

Dr. Joseph F. Geisinger,

Of Richmond, addressed the Medical Society of the District of Columbia at a recent meeting, his subject being "Unsuspected Massive Pathology in the Upper Urinary Tract".

Physician Wanted.

Excellent opening in Southside Virginia for sober industrious physician. Practice established forty-two years. For special inducement, apply to "Drug Store", care this journal. (*Adv.*)

Physician Wanted.

We have been advised that a physician is needed for general practice at a small town in central Virginia. Further information may be secured from Dr. J. H. Yeatman, Fork Union, Va. (*Adv.*)

Home for Convalescences.

A home for the care and treatment of chronic aged and convalescences has been opened at Arrington, Nelson County, Va., under the care of Dr. and Mrs. Fred M. Horsley. Information upon request. (*Adv.*)

Obituary Record

Dr. Peyton Stark Lewis,

Well-known physician of Richmond, died March 9, as a result of a heart attack. He had been forced to give up his practice several years ago on account of heart trouble but had recently resumed his work. Dr. Lewis was forty-eight years of age and a graduate of the Medical College of Virginia in 1919. He had been a member of the Medical Society of Virginia for sixteen years. His wife survives him.

Dr. Julian E. Tilman,

Prominent physician of Powhatan County, died February 25, after an illness of several months. He

was sixty-one years of age and graduated from the Medical College of Virginia in 1900. Dr. Tilman was active in civic and political life of Powhatan, having served as county coroner and chairman of the board of health. His wife and five children survive him.

Dr. Louis Christian Brand.

Word has been received of the death of Dr. Brand in Kwangju, Korea, on February 28, but no details were given. He had been a missionary to Korea since 1924 and was chief surgeon of the E. L. Graham Hospital which he founded. Dr. Brand was forty-three years of age and a graduate of the University of Virginia, Department of Medicine, in 1923. He was a member of the Medical Society of Virginia. His wife and three children survive him.

Dr. Michael A. Burns,

Professor of Neurology at the Jefferson Medical College of Philadelphia, died on March 7, 1938, at the age of 53. He graduated from Jefferson Medical College in 1907 and entered the neurological service there in 1908. He was appointed professor of Neurology in May, 1934.

Resolutions to Memory of Dr. R. Lee Seward.

The following resolutions were adopted by the Isle of Wight County School Board in respect to the memory of Dr. R. Lee Seward, whose death occurred on January 31:

WHEREAS, God in His Infinite Wisdom and Love has seen fit to call from our midst to His Work Above our fellow Board Member and co-worker, Dr. R. Lee Seward, and

WHEREAS, this faithful friend and loyal school official has endeared himself to us by both his private and public life, and

WHEREAS, he has served faithfully the schools of our County for twenty-five years as a member of the Newport District School Board and later the Isle of Wight County School Board, and

WHEREAS, he has been Chairman of the Isle of Wight County School Board since its constitution, and has presided over its deliberations with dignity and diligence;

BE IT HEREBY RESOLVED by the Isle of Wight County School Board in regular session this tenth day of February, 1938,

That we tender to the family in their loss and bereavement our heartfelt sympathy,

And trust, in addition to the Comfort that comes to them from Our Heavenly Father,

That they will find consolation in the knowledge of the services of Dr. Seward to his Community and his county; of his ministrations for fifty years as a physician to our people; of his services for twenty-five years as a school official building the educational facilities of his county; of his activities and interests in his beloved Church; of his contacts with many organizations working for a solution of the economic problems of his time; of his devotion to and love for his home, his church, his community, his county, his State and the South of his fathers; of his thoughtfulness as a husband, his devotion as a father, and his loyalty as a friend; that he carried himself in all these relationships as to be honored and esteemed by all who knew him; and

BE IT FURTHER RESOLVED, that a copy of these resolutions be spread upon the minutes of the County School Board of Isle of Wight County and a copy sent to the family.

ISLE OF WIGHT COUNTY SCHOOL BOARD
REA PARKER, *Acting Chairman.*
L. T. HALL, *Clerk.*

Resolutions on Dr. F. F. Davis.

The Mid-Tidewater Medical Society, at its meeting on January 25, adopted the following resolutions on Dr. Davis:

WHEREAS, an Ever-wise Providence has removed from our membership our beloved friend, Dr. F. F. Davis, who for over forty years has been one of the leading physicians of this section, and whose profound knowledge of medicine and love of his profession, and whose high character commanded the respect and admiration of all who knew him:

THEREFORE, BE IT RESOLVED: *First,* That we, the members of the Mid-Tidewater Medical Society deeply deplore the death of our friend and associate;

Second, That in his death the citizens of the County of Gloucester and the members of this Society have sustained a great loss. Dr. Davis was born in West Point, Va., on June 4, 1871, where he spent his early boyhood. He was educated at Randolph-Macon College, graduating in 1890, and the Medical College of Virginia, from which he graduated in 1894. Shortly thereafter he settled in Gloucester County where he practiced the profession of medicine until his death. During the World War he was honored by being named District Medical Advisor for the Draft Board. He died in Richmond, Va., on July 18, 1937. He was a gentleman always deeply interested in the welfare of his county and State, and actively taking part in its activities. For many years he was President of the First National Bank Gloucester, Virginia.

Third, We tender our sincere sympathy to the family of our deceased associate and friend, in their bereavement.

Fourth, That a copy of this resolution be spread upon the minutes of this meeting, and a copy be sent to the family of Dr. Davis.

H. A. TABB, M. D.,
W. S. COX, M. D.
Committee.